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An exploratory study of creativity -fostering teacher behaviors in secondary classrooms

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AN EXPLORATORY STUDY OF CREATIVITY-FOSTERING TEACHER BEHAVIORS IN SECONDARY CLASSROOMS

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by
Matthew J. Edinger
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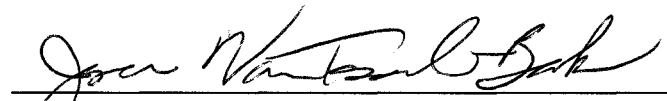
Approved April 2008 by



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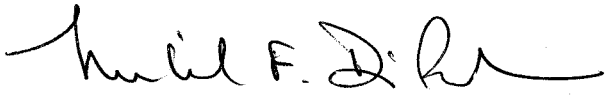

Michael F. DiPaola, Ed.D.

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Dedication

This dissertation is dedicated to my wife, Suzanne Keasey Edinger, for all of her support and encouragement throughout the beginning, middle and end of my dissertation process. It turned out that I didn't have to leave my house for the discussion of scholarly curiosities and wonderment. I wouldn't be who I am today without her lovely embrace. It continues to improve my life as it has since that early Sunday morning of September 16th, 1990

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to my children, Madison Keasey and Callen Matthew. I hope that I make you proud.

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ABSTRACT

The purpose of this exploratory study was to investigate creativity-fostering teacher behaviors in the context of the high-stakes standardized testing environment. The sample consisted of twenty, core subject teachers from a high school in a large, mid Atlantic suburban school district. Data were collected through Soh's (2000) Creativity Fostering Teacher Index (CFT Index), a 45-item self-report survey based on nine creativity-fostering behaviors identified by Cropley (1997). Data were also collected with the CFT Index Observation Scale to observe teachers who scored within the 50th percentile of the CFT Index. Interviews were completed using nine open-ended questions concerning creativity and classroom strategies used to foster creativity.

Findings suggest that 9th and 10th grade teachers utilize creativity-fostering behaviors to a moderate degree. Ten behavioral strategies appear to be utilized with a high degree of effectiveness. Additionally, the participants' ability to foster creativity in the classroom was improved by both supportive administration and instructional peers and was constrained by a lack of time and the constricting standardized testing environment. The findings suggested that factors, both personal and environmental, influence creativity-fostering behaviors and abilities.

Implications for practice and research were discussed. These include staff development programs aimed toward increasing awareness of specific characteristics of creativity-fostering pedagogy, such as open-ended questioning techniques, problem

solving, and freedom with focus. Administration can positively influence the teachers' ability to be creative in the classroom by being "open to ideas," by making teachers aware of professional opportunities, and planning meaningful staff development. Future studies with larger samples could use the CFT Index observation tool to conduct a more in-depth program of qualitative research. Future research could also explore the creative abilities and experiences of administration and the relationship this has to policy decisions, new hires, and the administrative-faculty relationship.

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AN EXPLORATORY STUDY OF CREATIVITY-FOSTERING TEACHER BEHAVIORS IN SECONDARY CLASSROOMS

Chapter One: Introduction

Fostering creativity is an integral part of education and should be a guiding principle for teaching all *children. It should not be reduced to a collection of set exercises carried out at fixed times as part of a 'creativity program'...The desire to foster creativity is at the heart of a philosophy or principle that should underlie* all *teaching and learning in all subject areas and at all times.*

A.J. Cropley, 2001, p. 151

Introduction to the Study

Educational research opened its doors to the concept of creativity during the 20th century. This research has benefited educational goals, strategies for practitioners, and guidelines for educational administrators (Torrance, 1983). Researchers have furthered the importance of promoting favorable conditions for fostering creative potential through educational environments (Alencar, 1993; Amabile, 1989; Daniels, 1997; Piirto, 1992; Starko, 1995; Sternberg & Williams, 1996; Timberlake, 1982). However, along with similar findings from other researchers, Jones, Jones, and Hargrove (2003) found that high-stakes testing limits the flexibility of teachers and decreases creativity-fostering teacher behavior due to the emphasis of drill-and-kill skills. What is really happening in our classrooms in the era of No Child left Behind (NCLB, 2001) now that the need for both creativity and high stakes testing are warranted? Have a large percentage of teachers been transformed into 'drill sergeants' as they 'teach to the test'? To what extent are

teachers able to deliver appropriate content without sacrificing creativity and the environment that fosters it?

The purpose of this exploratory study was to examine creativity-fostering, secondary teachers' instructional strategies and behaviors in the high-stakes standardized testing environment, emphasized by the recent No Child Left Behind Act of 2001 (NCLB). Soh's (2000) CFT Index and the CFT Index Observation Scale were used to measure teachers' creativity-fostering behaviors as well as observations of these behaviors in the classroom. Data was collected via teacher-participant surveys, interviews, and classroom observations.

Statement of the Problem

With its dominant focus on accountability and testing, NCLB elevates the fear of educators troubled by the potential impact of the legislation on teaching practices and the fostering of creativity in the classroom. NCLB establishes a comprehensive framework of standards and accountability that lead to a surmounting wave of testing not present in previous educational legislation. NCLB also removes some local administrative discretion in determining the goals and outcomes of local education programs. National report cards are issued to each American school and district resulting in greater federal dollars for school districts that have demonstrated success according to the NCLB guidelines. Failing schools and districts are disciplined with the removal of federal funds, pressure for privatization and public school choice. According to the NCLB guidelines, all students in the 3rd and 8th grades were initially tested in reading and math. Testing in science and social studies have since been added. All students determined to be 'testable' must demonstrate 'proficiency' by the

2013-2014 school year. In short, Day-Vines and Patton (2003) define NCLB as a law that is "designed to improve the academic performance of American children through the creation of highly qualified teachers and a unified system of education that creates high academic and behavioral standards and increases institutional accountability for adequate yearly student progress" (p. 1).

The reaction to NCLB throughout our nation's educational system has created a swell of opposition since its inception. Among many others, Fusarelli (2004) reports "Critics fear NCLB will reinforce a culture of blaming the victim and will force teachers to spend more time on test-prep and drill-and-kill exercises rather than on authentic teaching and learning" (p. 4). Fusarelli suggests that this reveals the act's punitive 'success or else' nature. As Baker (2002) observed, "People want to avoid punishment, and they do what they must" (p. 2).

In a three-year study of the effects of New Jersey's 4th grade test on math and science teaching, Firestone (2001) found that 'the test drives the curriculum'—a finding consistent with critics' attacks on standardized testing and NCLB. Researchers agree with this outcome, while some fear NCLB will demoralize teachers and school administrators—further exacerbating shortages in these professions (Jones et al., 2003).

Research demonstrates that high-stakes testing leads to a narrowing of instructional practices, test preparation, and increased use of drill and practice (Haney, 2000; McNeil & Valenzuela, 2001; Smith and Rottenberg, 1991). In a study of the effects of high-stakes testing on teachers in North Carolina and Florida, Jones et al. (2003) found that it limits the flexibility of teachers and decreases the creativity

of teachers and students by emphasizing drill-and-kill skill sets—leaving little time for students to explore and discover the world around them, to develop critical thinking skills, or to become better human beings.

Giroux and Le Schmidt (2004) suggest that high-stakes testing has distressing consequences such as discouraging teacher autonomy, thereby lessening curriculum quality. When the conception of lessons and lesson planning is separated from their implementation in the classroom, educators lose autonomy while skill possibilities and creativity-fostering are stripped away. The art of teaching becomes reduced to educationally technical 'drill sergeants' (p. 9). Giroux and Le Schmidt state:

> Under such conditions, teachers are excluded from designing their own lessons and the pressure to achieve passing test scores often produces highly scripted and regimented forms of teaching. In this context, work sheets become a substitute for critical teaching and rote memorization takes the place of in-depth thinking (p. 10).

Modeling is a key concept in the art of teaching. Broadfoot (1996) reminds us that "teachers...shorn of the capacity to use their own ideas, judgments, and initiative in matters of importance can't teach kids to do so" (p. 47). When teachers can not foster creativity in the classroom, students cannot model creativity.

As High-Stakes Testing Moves In, Creativity Moves Out

Some teachers claim that they are less creative in their teaching, and that instruction has been reduced to "a cookbook kind of approach—do this, do that, get those skills ingrained " in order to get high scores on standardized tests (Perreault, 2000, p. 708). This testing pressure has eroded the ability of some teachers to foster

creativity. Another teacher stated, "At my school, creativity is blown out the window" (Gordon & Reese, 1997).

Further exacerbating the problem, some teachers believe that if they do not teach with a certain method that their students will not perform successfully on the tests. One teacher stated:

> I'm not the teacher I used to be. I used to be great, and I couldn't wait to get to school every day because I loved being great at what I do. All of the most powerful teaching tools I used to use every day are no good to me now because they don't help children get ready for the test, and it makes me like a robot instead of a teacher (Barksdale-Ladd & Thomas, 2000, p. 392).

High school science teachers have reported that testing greatly reduced teachable moment opportunities, teaching impulsiveness and depth, and 'reduced the number of unusual and interesting things' that they used to foster creativity in their classrooms (Wideen, O'Shea, Pye, & Ivany, 1997). In a study conducted by Jones and Johnson (2002), a 4th grade teacher reported that her particular teaching methods had a negative impact on students' creativity. She indicated that they "put down on paper only what they think they should, and not what they want...they're not learning to express their feelings and emotions...they leave out the best parts of writing...they're learning to dread writing" (p. 8).

However, researchers have studied and found positive findings when examining teacher response to mandated testing. Cohen and Hill (2001) suggest that teacher access to local support, such as professional development devoted to teaching novel practices, aid teacher response to testing. They state that new teaching

techniques are more likely to enhance instruction and guide schools and districts to more valid increases in student achievement.

Firestone et al. (2003) examined the effects of state tests in new mathematics and science for nine year-olds in New Jersey. They found that, during the initial three years of implementation, some teachers explored inquiry-oriented approaches and built test preparation into their regular teaching, while other teachers responded by intensifying didactic instruction and adopting short-term, 'decontextualized' test preparation strategies. The researchers stated that those teachers' who knew more about the standards were more confident of their own teaching ability and they appeared to explore challenging instructional approaches more. Ultimately, all of the teachers positive or negative responses depended somewhat on the pressures and support they faced in their school or district.

More often than not, high-stakes testing, propelled by NCLB, creates negative effects on teaching practices including a preponderance of teacher-centered approaches and a decline in teachers actually fostering creativity. To date, there have been few empirical studies (Firestone, 2001; Jones et al., 2003) considering the effect of NCLB and other high-stakes standardized testing programs on creativity in the classroom. There are many examples of creative practices described below, but the research examining post-NCLB creativity-fostering strategies of 9th and 10th grade teachers is nonexistent. Also not addressed in the research is how some teachers, such as those scoring well on assessments like Soh's Creativity Fostering Teacher Index (CFT Index), are still able to incorporate creativity in their classrooms despite the testing atmosphere created by NCLB. Soh (2000) states:

> It cannot be over-emphasized that there is a need to study teachers' creativity fostering behavior as the teachers' conscious and unintentional influences on student creativity through their daily interaction in the classroom. This research is needed to complement research on student creativity for a more complete understanding of the effect of teaching behavior on the development of creativity (p. 130).

By incorporating the work of Guilford (1950), Gagne (1995), and Soh (2000), the investigator examined how creativity is fostered through behaviors of teachers in 9th and 10th grade classrooms. Soh's (2000) CFT Index and the CFT Index Observation Scale were used to measure classroom behaviors and observations of creativity-fostering behaviors. The research design employed in this study was a sequential exploratory mixed method approach. Data were collected from teacher surveys, interviews, and classroom observations. The investigator hoped to gain new insight into the fostering of creativity and the degree to which it is fostered in high school classrooms for implications in the fields of both gifted and regular education.

Conceptual Framework

Several researchers of distinction have produced work in the field of creativity that was pertinent to this study. Guilford (1950) was first to suggest that creativity could be defined as a measurable construct. More importantly, for this study, Guilford broached pertinent issues for educators in an unprecedented speech to the American Psychological Association concerning the subject of creativity. His speech conceptualized a scientific approach to creativity and how it could be measured

through psychometric testing. Guilford also specified how the terms fluency, flexibility, novelty, and evaluation could enhance creativity in the classroom.

Cropley's (1997) nine behaviors of creativity-fostering teachers delineate factors that are both personal and environmental. According to the model, the creative aptitude domain transforms through the process of training and practice towards the field of academics. Gagné (1995) outlines a formal model for that talent development process. He states that giftedness is "the possession and use of untrained and spontaneously expressed natural abilities (called aptitudes or gifts) in at least one ability domain" while talent is "the superior mastery of systematically developed abilities (or skills) and knowledge in a least one field of human activity" (p. 109). Gagné associates giftedness with natural or untrained human abilities that he labels aptitudes. He further asserts that giftedness is compatible with superior performance in one or more of the intellectual, socio-affective, sensorimotor, or creative aptitudes. In terms of talent, Gagné links it to considerable above-average performance in, among many others, the Arts, Business and Commerce, or Sports fields. Finally, he suggests that the progression of education, practice and training allow the development of talents from aptitudes. But researchers and practitioners alike must remember that this development is arbitrated by factors both intra-personal and environmental.

Statement of the Purpose

Cropley's (1997) nine behaviors of creativity-fostering teachers identified 'creative' as a domain affected by persons in the 'environmental condition' within the talent development process. Student learners are immensely affected by teachers in

the educational environment of the classroom. The teacher becomes the catalyst in the developmental process with either positive, neutral, or negative outcomes. How many teachers are successful at fostering creativity in the current NCLB-era classroom? What strategies make teachers more effective at fostering creativity? How do teachers who self-report that they implement creativity-fostering behaviors effectively use these strategies in the classroom? What teacher characteristics are needed for creativity-fostering effectiveness? What forces enable or disable teachers to successfully develop creative talent in students?

The purpose of this exploratory study was to examine creativity-fostering, secondary teachers' instructional strategies and behaviors in the high-stakes standardized testing environment, emphasized by the recent No Child Left Behind Act of 2001 (NCLB). Soh's (2000) CFT Index and the CFT Index Observation Scale were used to measure classroom behaviors and observations of creativity-fostering behaviors. This study was also designed to examine the factors that impede or facilitate creativity-fostering behaviors in teachers, and the degree to which 9th and 10th grade teachers report the use of creativity-fostering behaviors in their classrooms. Data were collected via teacher surveys, interviews, and classroom observations.

Research Questions

The following questions guided the study:

1. To what degree do 9th and 10th grade teachers report the use of creativity-fostering behaviors in the classroom based on Soh's CFT Index?

2. What strategies for fostering creativity are implemented by teachers who score in the top 50 percentile of the CFT Index measure?

3. What are the factors that impede or facilitate creativity-fostering behaviors in the teachers who score in the top 50th percentile of the CFT Index measure?

Definition of Terms

Major terms used in this study are defined here in order to clarify their specific meanings. The definitions are those which are commonly accepted in the field of K-12 education as noted by appropriate citations.

1. Creativity. "Creativity is in the personality, the process, and the product within a domain in interaction with genetic influences and with optimal environmental influences of home, school, community and culture" (Sternberg & Lubart, 1995, p. 392).

2. Creativity-Fostering Behaviors. "The mechanism by which a teacher can encourage or discourage student creativity, intentionally or inadvertently (Soh, 2000, p. 119). For the purpose of this study, these behaviors are cultivated by classroom teachers for the result of creativity in the student's preplanning, planning, and project completion stage.

3. Differentiation. Qualitatively different curriculum modified in the areas of content, process, product, and learning environment (Ward, 1982). For this study, differentiation also includes the use of strategies to modify instruction of individual students.

4. Gifted Education. This field of education addresses the academic, social, and emotional needs of K-12 students determined to be gifted (VanTassel-Baska, 1998).

5. No Child Left Behind Act of 2001 (NCLB). NCLB significantly raised expectations for states, local school districts, and schools by trying to ensure that all students meet or exceed state standards in reading and mathematics. NCLB requires all states to establish academic standards and a testing system that meets federal requirements. (Georgia, p. 1, 2001).

6. Secondary Education. In this study, secondary education is defined as grades 9 and 10 in a suburban high school.

7. Zeitgeist. The general intellectual, moral, and cultural climate of an era (Merriam-Webster, 2007).

Significance of the Study

This study was significant to the field of gifted education for many reasons. First, it provided an initial inquiry into the driving forces for fostering creativity in high school classrooms in the NCLB era. Currently, researchers believe that the environment has a strong effect on creative production, and that minor features of the close social environment influence personal creativity (Fusarelli, 2004; Haney, 2000; Jones et al., 2003; McNeil & Valenzuela, 2001). This study also provided an examination of the factors that impact 9th and 10th grade teachers who self-report the use of creativity-fostering behaviors in the classroom according to Soh's (2000) CFT Index.

Next, observations conducted in classrooms demarcated strategies for nurturing creativity with high school-aged students. For example, Cropley (2001) suggests that teachers should provide challenging and stimulating learning materials, and enable self-directed work, allowing for a high degree of initiative, spontaneity

and experimentation without fear of sanctions against incorrect solutions, errors, or mistakes. The research provided an overview of appropriately modified instruction for fostering creativity in secondary classrooms.

Lastly, analyzed interview data from teachers that scored within the top 50 percentile on Soh's (2000) CFT Index determined factors that appear to impact the secondary education of gifted students. The CFT Index required teachers to delineate ways in which they think about and regard the fostering of creativity in their classrooms and school.

Such information is valuable to educational professionals involved with students, pre-service teachers, and staff development personnel. Also, educational leaders in regular and gifted education fields can use the findings to that make instructional decisions at the local, state, and national levels.

Limitations and Delimitations

Limitations

Several limitations in this study influenced the generalizability of the results. Limitations are defined as prospective study drawbacks (Creswell, 1994). The survey packet was distributed through the investigator's and teacher participants' school inter-district mail system. The investigator emailed all of the teachers that were currently teaching 9th and/or 10th grade students. The school's current climate and timing of when the teacher received the survey packet may have influenced the results. The investigator's interaction with the participants through email and the survey instruction letter also may have influenced the results. The teachers-participants' perceptions of the study and whether the outcome would positively or

negatively affect their position in the school may have either positively or negatively skewed the results.

Soh's (2000) CFT Index was administered to a non-random sample of teachers. The study was limited by the convenience sample and lack of representation of a broader sample of teachers across schools. This also greatly limited generalizability.

Finally, some aspects of external validity could be questionable. Observer biases and expectations may have led to distortion of data collection and interpretation (Borg & Gall, 1989, p. 404). The investigator's bias could have stemmed from the fact that he has been both studying the concept of creativity and teaching in the secondary classroom for many years. These facts could have affected the way he perceived, received, and interpreted the data.

Delimitations

Delimitations define how the study may be constricted (Creswell, 1994). Delimitations that may have limited the scope of the study relate to the sample for the surveys, observations, and interviews. The study's teacher self-report survey and the two one-hour classroom observations only occurred within one public high school. Also, the use of closed-ended statements in the CFT Index and the CFT Index Observation Scale that allowed the investigator to manage the analysis of the responses more efficiently delimited the quality and extensiveness of the overall data collected. Interviews and Soh's CFT Index Observation Scale were completed with those teachers who scored within the top 50 percentile on the CFT Index self-report survey. Finally, the investigator decided to use 50 percentile as a limit for participant

invitation to interview to allow for rich description from participants that reported using creativity-fostering behaviors to a greater extend.

Chapter 2: Review of the Literature

This review of the literature focuses on several themes found within the conceptual framework for this study and beyond it. These include creativity, teacher creativity-fostering qualities and competencies, activities that foster creativity, and differentiated instruction in gifted education that supports creativity in the classroom.

Introduction to Creativity

Prior to the publication of *Hereditary Genius*, Sir Frances Galton (1892) began inquiries into genius, or what he called "expressing an ability that was exceptionally high, and at the same time inborn". Less than three decades later Terman began to plan an unprecedented longitudinal study of nearly 1,500 gifted students (Terman, 1925; Terman and Oden, 1947; Terman, 1959). This study provided a rich description of and brought attention to the lives of gifted children. Leta Hollingsworth (1942) also completed important work with highly gifted children, and she was able to steer her gifted research toward the public education of gifted children.

Background of the Gifted Movement

The gifted construct gained extraordinary national recognition after the launch of the Soviet Union's space satellite, named Sputnik, in 1957. The launch served as a wake up call—nearly a call to arms—for Communist-weary Americans as the spotlight fell on the uncertainty of America's future. School children were now viewed as the future of America and a gifted education movement began. In 1971, the

American federal government undertook a substantial initiative, known as the Marland Report, which defined giftedness as 'high performance' and 'outstanding abilities'. The Marland Act of 1971 (1972) delineated the adjective 'creative' as a focal area of gifted education. As the current United States Commissioner of Education, Marland's inclusion of creativity placed emphasis on the need to value this concept in American classrooms through the rest of the decade. The foundation of creativity in the minds of educators was sealed a few years later with the publication of Howard Gardner's book titled *Frames of Mind* (1983). Gardner emphasized how necessary the different types of intelligences and thinking patterns were to learning in the classroom, and how creativity was an aspect of each of Gardner's seven intelligences: linguistic, logical-mathematical, bodily-kinesthetic, spatial, musical, interpersonal, and intrapersonal. Creativity, as a construct in the field of gifted education, has had a rich, prosperous history in the research literature for nearly fifty years (VanTassel-Baska, 1998).

Researcher and Practitioner Study of Creativity

Renzulli's (1978) Three Ring Model highlights the interaction among creativity, task commitment, and above-average ability. He reflects on the relationship between these areas and General Performance Areas, such as math and science, and Specific Performance Areas, such as cooking or fashion design. Renzulli typifies giftedness as having two dimensions: Schoolhouse and Creative-Productive. Schoolhouse Giftedness characterizes those individuals who have undeterred success with tests and learning from lessons. However, Renzulli notes that there is no level of correlation between IQ scores and individual school performance. More important for

this study, Renzulli labels the second category of giftedness as Creative-Productive Giftedness. In this category, a large significance is placed on developing original items intended to benefit specific groups of people. Renzulli asserts that each dimension holds its own importance and that interaction between the two usually transpires.

As stated above, Gagné's (1995) Differentiated Model of Giftedness and Talent (DMGT) suggests that the surrounding environment to an individual's developmental process greatly affects outcomes within creative domains. It is yet another model that has provided insight and a specific paradigmatic lens through which researchers and practitioners have and can continue to study creativity.

What is Creativity?

The origin of creativity is connected to the earth. The Latin roots of create and creativity are *creatus* and *creare*, meaning 'to make or produce' or literally 'to grow'. The word comes from the Old French base *kere* and the Latin *cresere* and *creber*, "from which comes the names of the Roman goddess of the earth, Ceres, and of the Italian corn goddess Cereis" (Piirto, 1992, p.6).

Researchers and practitioners have been trying to pin a definition on creativity for many years. It is difficult to define since creativity has been found in many different disciplinary fields, including cognitive and artistic domains. Although there has been theoretical consensus on the general attributes of creativity, definitions are many and depend on research conclusions, the investigator, and the study itself.

In 1892, creativity was first theorized as a 'mental quality' in Galton's study of men of genius. He describes the idea of creativity by stating:

> By natural ability…I mean a nature which, when left to itself, will, urged on by an internal stimulus, climb the path that leads to eminence, and has a strength to reach the summit-one which, if hindered or thwarted, will fret and strive until the hindrance is overcome...(p. 157).

In 1926 Wallas recorded instances of discovery in science, literary productions, and other recognizable output from creative geniuses. Wallas' *Art of Thought* (1926) considered creativity a legacy of the evolutionary process, which allowed humans to quickly adapt to rapidly changing environments. Wallas also suggested that the definition of creativity consisted of steps: namely, preparation, incubation, illumination, and elaboration. From 1935 through 1941, Patrick, a psychologist, attempted to identify these steps in order to see what creative roles each had in a discovery event. She found that the process was relevant, but that a specific order was not followed at all times. In 1952, Eindhoven and Vinacke supported these findings with similar conclusions. Rogers' (1961) idea of the fully functioning person involved five qualities, including creativity, full participation in the world, and contributing to others' lives. These findings are extremely important as they create the foundation of current thinking on creativity.

Current Definitions of Creativity

Modern definitions of creativity include Renzulli (1986), who proposed an alternative definition of giftedness where all aspects, such as above-average ability, high motivation and creativity, need to be present before gifted behavior can be practiced by the student and recognized by educators. Perkins (1988) thought that "a creative result is a result both original and appropriate. A creative person—a person

with creativity—is a person who fairly routinely produces creative results" (p. 311). Finally, Piirto (1994) suggests that, "Creativity is in the personality, the process, and the product within a domain in interaction with genetic influences and with optimal environmental influences of home, school, community and culture" (p. 392). These definitions merge creativity and the environment, a concept that suits the idea of investigating creativity in a classroom.

Creativity, one can argue, even has a specific area within a human being. Popular psychology refers to concepts and theories about human mental life and behavior that come from outside the technical study of psychology, but purport to go beyond everyday knowledge. Pop psychology and popular myths about the brain simplify these distinctions into a very crude binary system whereby a person appears pre-dominantly 'left-brained' and logical or 'right-brained' and creative. However, this is only the psychology, or myth perspective, of one living in Western culture.

Creativity Definitions Shaped by Culture

Many researchers agree with the adage, 'Beauty is in the eye of the beholder' in that creativity's definitive measure comes from the opinion of the local culture. Csikszentmihalyi (1991) reported that the creativity of a work of art was undoubtedly measured in terms of how the culture accepts it and the amount of significance the culture gives the piece. Creative people, as defined by Ochse (1990), are those who add something of value to the culture. Furthering this definition, Jensen (1996) purported three measures including explicit production, professional acknowledgment honors, and judgment from peers. It can be said that creativity becomes a cultural commodity. Unfortunately, great works of creativity that are not sold as such are

never remembered until discovered by another culture at another time. Perhaps the adage would more rightly be stated as, 'Beauty is in the eye of the times'.

Early Research in Creativity

The lack of specific definitions of creativity has not stopped seminal research from emerging. For fifty years, several researchers of distinction have produced work in the field of creativity by trying to conceptualize it on various levels.

Measurable creativity. Guilford (1950) was first to suggest that creativity could be defined as a measurable occurrence. He also proposed that creativity came with a great amount of domain specificity, explaining that it was inherent in the fields of science and technology, more so than others. More importantly for the current study, Guilford broached the suggestion of two possible issues for educators in a speech to the American Psychological Association. He delineated how to search for creativity in children and how to develop creative personalities. Guilford identified divergent production as the creative generation of multiple answers to a set problem. He suggested that the terms fluency, flexibility, novelty, synthesizing ability, analyzing ability, reorganization or redefinition of new ideas, degree of complexity, and evaluation could enhance creativity in the classroom. These terms illustrate divergent production (Piirto, 1998).

Quantitative creativity. At the University of Georgia, Guilford mentored a researcher named Torrance. The field of gifted education was enhanced by Torrance's (1983) creation of the Torrance Test of Creative Thinking (TTCT). His test became a standardized measurement, with high levels of validity and reliability, of creativity and divergent production. Those who scored well on the TTCT were subsequently

regarded as creative or as having 'potential creative ability'. However, because the TTCT measured creativity, or rather creative attributes that were quantitatively hard to measure, the test caused debate among researchers and practitioners. Even though the test was effective with standard measures, the findings could not become predictors of children who creating products that were both original and enduring. Next, while searching for verbal bias, McCormack (1975) studied the use of figural forms found in the TTCT. Torrance specified that proctors of the tests should not delineate illustrations of 'model responses' to the test takers since examples could reduce originality. Still, McCormack found that nonverbal protocols affected the subjects' scores since the test itself led the test takers to correct answers. Even with the controversy of his Test, the field of creativity highly benefited from Torrance's work. He helped bring the 'fuzziness' of creativity into a quantifiable focus.

Creativity and intelligence. In 1962, Getzels and Jackson wrote a book titled *Creativity and Intelligence* that examined the possible link between creativity and intelligence. Their study consisted of Illinois students in grades 6-12 who were tested and given the label of 'creative' for a high score in divergence and 'intelligent' for a high convergent score. The researchers made the assumption that all students had intellect and creative abilities to some degree, and high scoring students in both concepts were eliminated from the study. This bias took away the researchers' ability to see possible links between creativity and intelligence. Even though the sample, consisting of private-school, middle-class students, substantially limited the generalization of the study, Getzels and Jackson's book was seminal to the foundation

of gifted and creativity research. A common finding among researchers is that highly creative people do not have to be the most intelligent, but must have intelligence.

Predicting the development of creativity. A 1969 study by Wallach and Kogan, *Modes of Thinking in Young Children*, suggested that fifth graders produce better answers when allowed to work in an un-timed, non-threatening environment for testing. In 1975, Wallbrown and Huelman replicated this study using a sample of urban students. A positive relationship was found between the judges who rated the creative products on originality and effectiveness of expression and the creativity measures. The significance of these studies—similar findings with a different sample—led to the further development of measuring and predicting for creativity.

Later Models of Creativity

In the visual arts, Getzels and Csiksentmihalyi thought that creativity was primarily for reducing conscious or unconscious tension through imagination. This breakthrough study, called *The Creative Vision*, (1977) linked problem solving, through creativity, to cognitive domains. Creativity was no longer seen as a separate construct.

Problem solving as creativity. As mentioned earlier in this chapter, Renzulli's Three-Ring Model (1977) highlighted the interaction among creativity, task commitment, and above-average ability and reflected on the relationship between these areas and general and certain performance areas. The transition within gifted education to this model was emphasized by Renzulli's research through the highlighting of creativity in classrooms as was stated earlier in the Marland Report (1972). Renzulli also suggested that direct application was the best way to teach

creativity. The measure of creativity began to move from the pressure of cognitive testing towards the idea of assessing tangible products.

Replication of findings. Delcourt (1994) later replicated Renzulli's findings in a study. In her article titled "Characteristics of high-level creative productivity: A longitudinal study of students identified by Renzulli's Three-Ring Conception of Giftedness", Delcourt suggests that, after testing students who were enrolled in these programs, they demonstrated high levels of creativity and were thought of as creative by their fellow students. Although the sample was small, the researchers plan to continue this study well into the professional lives of the eighteen students.

Creativity alignment with intelligence. As mentioned earlier, Gardner linked creativity with seven forms of intelligence and hugely impacted the way America imagined thinking and practice in the education system. In his book, *Frames of Mind* (1983), Gardner described the six forms of intelligence noted above and even went so far as to describe different attributes and skills found within each domain. This marriage of creativity and intelligence in Gardner's study was novel and further embedded creativity into academic and even physical domains.

A few years later, Sternberg (1985) delineated creative giftedness as one of three types of giftedness. In *The Triarchic Mind*, Sternberg describes creative giftedness as the ability to adapt when new and unique situations arise. He further suggested that creative people "make discoveries and devise the inventions that ultimately change society" (p. 74). Like Gardner, Sternberg also made the connection between creativity and intelligence. He later described six facets of creativity. They include creative intelligence, specific domain knowledge, a certain style of mind,

certain aspects of personality, motivation and, most important for this study, a nurturing environment.

Feldman (1986) studied boys and girls that greatly exceeded their physical age and experience in the field of music, writing and chess. His *Nature's Gambit* defined creativity as a large promulgator of culture and the reason behind the transformation of the fields of academia. Feldman made an association between creativity, intelligence, and knowledge by defining creativity as reaching an expert level in a field.

Creativity and eminence. Gardner's *Extraordinary Minds* (1997) was one of many studies that linked creativity and eminence in the education field. Gardner described different forms of extraordinary thinking that used creativity to its end. Mohandas Gandhi was classified by Gardner as an influencer of people and a public leader. Gardner's study of creativity looked beyond a single definition or product of creativity, but applied it to various domains. He suggests that each domain has its own parameters for creativity, from Virginia Woolf's creation of literature to Freud's creation of a non-preexisting domain of psychology.

Creativity in the Classroom

Relationship between Creativity and Learning

Torrance (1962) created seminal findings when studying creative talent in the classroom context. He called attention to the need for educators to guide creative students since a healthy personality was dependent on the relationship between the classroom and their own creativity. Torrance suggests that both parents and the school must recognize that all children have at least the smallest of seeds of creativity

that must be planted in experiences and watered with guidance to fully bloom. Many decades have passed, but Torrance's work continues to arm educators with a guide for the needs of creative students.

McCormack (1975) investigated including creative thinking training in general education science classes. The experimental group of university students was given brainstorming activities while the control group was not. When both groups took the TTCT, the experimental group scored with increased levels of fluency, originality, and flexibility. Next, Parnes and the Creative Education Foundation (1975) developed the Annual Creative Problem-Solving Institute. Parnes applied creative problem solving and evaluation and found that the students were able to 'actualize imagination expansion' throughout many phases of the problem-solving process. Finally, the relationship between creative dramatics instruction and creativity in children was investigated by Schmidt, Goforth, and Drew (1975) in the same year. The experiment group of kindergarteners was given thirty-minute sessions of creative dramatics twice a week for eight weeks. Measurable differences in creative thinking were found in these students by measures created by Rotter (1975) and Wallach and Kogan (1969).

Amabile (1983) believed that creativity is a triumvirate of factors: specific domain knowledge, skills that are conducive to creativity, and internal motivation to contribute to a specific field of knowledge. She made the connection between creativity and a knowledge base, leading to the discovery that the process of creativity was not complete without a knowledge base. Amabile's connection between creativity and knowledge was elaborated by Feldhusen (1995), who stressed the

significance of meta-cognitive skills for the creative process. He suggested that meta-cognitive skills were necessary for managing new information, a fluency of knowledge base and skill mastery, and attitudes and motivations. These tools are needed to allow alternatives, configurations, and unique solutions to present themselves to students.

Some researchers suggest that the creative process is fleeting and equally hard to invoke in the classroom. Csikszentmihalyi (1991) interpreted the creative process as involving 'flow', or the optimal experience that happens when someone becomes totally involved in something and loses sense of time and surroundings. He suggests that creative energy can be controlled from the inside of the creator. 'Flow' occurs between the levels of boredom and anxiety within the classroom. Csikszentmihalyi's study findings suggest that knowing the creative process as well as how to stimulate creativity is very important for administrators and teachers of gifted students. In 1994, Hansen and Feldhusen studied the effects of trained and untrained gifted and talented teachers on gifted students. They found that trained teachers "placed a greater emphasis on creativity and encouragement of creative thinking and provided a more accepting environment. They encouraged fluency, flexibility, originality, and elaboration; asked more open-ended questions; and encouraged more risk-taking than did untrained teachers in the study" (p. 119). This research supports the widespread need for the creative process in the classroom.

In 1991, Sternberg and Lubart defined the six elements of creativity as thinking styles, intelligent processes, knowledge, personality, environment, and motivation. Children in the classroom, according to these researchers, should be given

confidence to not only find problems, but to define them as well. Also, students should take risks in their work and be taught how to flexibly use knowledge. This research presented yet another link for administrators and educators of the gifted—knowledge base, logical thinking and creativity are interconnected, and our schools must be aware of these meta-cognitive processes.

Empirical Research on Creativity

Factors for Nurturing Creativity in the Classroom

Rekdal (1979) called for developing creativity in an atmosphere that was academic, but warned that schools run the risk of only labeling 'creative underachievers' instead of fostering their academics. Rekdal did not support academic programs that used intellectual and achievement scores as the only entrance hurdle for students. He felt that creative thinking potential was found in those that had both intellectual and creative abilities.

Milgram and Hong (1994) studied adolescents in Tel Aviv. They uncovered a relationship between creative performance domains and adult accomplishment in the work area. Milgram and Hong suggest that a stronger link exists between creativity and work accomplishment than between levels of general intelligence. This is important for educators, as they need to be aware of students' creative development.

Renzulli and Callahan (1979) elaborated on the training of creativity in the classroom. The authors emphasized that student freedom allowed the development of new ideas. This growth aids the likelihood of creating unique and innovative ideas in the classroom. Fluency was aided through the use of training activities that lacked predetermined answers.

Osborn (1963) developed training activities in a program called the Creative Problem-Solving (CPS) program. It was further refined by Parnes (1967, 1981), Isaksen and Treffinger (1985), and Treffinger, Isaksen, and Dorval (1997). Divergent and convergent thinking stages are prominent in this program. Some of its brainstorming rules include deferring judgment, endeavoring for quantity of ideas and unusual ideas, and seeking an amalgamation of these ideas. Treffinger (1996) states that the initial version of the CPS process was a linear stage model with a prescriptive map for specific strategies. More recent accounts suggest that the CPS process is a framework for organizing a variety of methods that individuals select for specific assignments.

Kertzberg and Reale (1999) conducted a study that investigated the increase in creative output of 43 eighth graders by teaching a portion of the Future Problem Solving (FPS) process. The treatment group of heterogeneously assembled science students received training on the identification of problems phase of FPS as part of their middle school curriculum. The control group did not. FPS uses team creative-problem-solving strategies to solve imprecise futuristic problems. Both science classes earned similar scores on the study pretest, but the treatment group scored nearly twice the amount using FPS scoring protocols. The researchers found that fluency and flexibility could be taught using FPS.

Plucker and Goreman (1999) conducted a qualitative evaluation study on high school students attending a summer college program. The invention process was the theme of this program. The researchers found that students recognized the value of diverse skills and talents when working in a group, reflection, and how failure and

frustration can be constructive and temporary. One year later, face-to-face interviews with students led the researchers to believe that the learned values were still retained, even expanded.

In another qualitative study, Terry (2000) studied 28 gifted students that participated in Community Action, a program that involves problem solving at the community level. The study project involved 'downtown beautification' and the education of community members about the community's historical resources. Group and individual interviews, as well as document review and observations led the investigator to believe that the students had grown creatively. Terry reflects, "Students must have opportunities to work cooperatively; to learn the skills of creative problem solving, to have ample, formal reflection activities" (p. 3058A). These studies of creativity-fostering activities found that specific programs fostered the students' ability for fluency and flexibility, diverse skills, and novel thinking.

In addition to summer and community projects, Eriksson (1989) outlined strategies that may enhance students' work within writing, music, drama and integrated art. Of major concern were internal and external blocks the students arrive with at the schoolhouse gate. Teachers must be aware of the limited ways that their students perceive the world and the environment that imposes ways of thinking and behaving.

de Souza Fleith (2000) concluded with the following idea on creativity training for educators:

> Descriptions of activities that enhance creativity in the classroom, as suggested by teachers, were not the focus of experts in the field. Instead they

> discussed and provided alternatives regarding the implementation of activities in the classroom. Although teachers were aware of the characteristics that enhance creativity in the classroom, it seems that the transference to practice was intuitive. Teachers' lack of procedural knowledge may be explained by the fact that they have not received formal creativity training. Therefore, a creativity training program for teachers, involving instructional planning, discussions, and follow-up observations might be helpful to guide and systematize teachers' efforts and knowledge (p. 152).

Even teachers must learn how to think and behave as creative people if they are going to have the skills and experience needed to teach their students how to be creative.

Why Creativity in the Classroom?

Sternberg and Lubart (1991) state that, "to engender creativity, first we must value it!" (p. 614). Creativity has drawn significant interest from many educational researchers for the past 60 years. As discussed above, the concept has been defined in many different ways over the years. The example given was that Piirto defines creativity as "the personality, the process, and the product within a domain in interaction with genetic influences and with optimal environmental influences of home, school, community and culture" (1995, p. 392). This is yet another particularly applicable definition of creativity for this paper as it stresses the importance of environmental factors in the exercise of fostering creativity.

Initially, creativity was viewed as a concept that was internal in the creative person. However, Amabile (1983) and Csikszentmihalyi (1996) found that the environment has a strong effect on creative production. Amabile's (1988) model

suggests that minor features of the close social environment may influence personal creativity. For example, creativity may be impeded when outcome rewards are previously decided, when undue time pressures are enforced, and with intense teacher supervision. Evaluation of products, competition, and a lack of method and material choices also affect creativity. Educators must realize the importance of ensuring favorable student conditions for creative potential, and incorporate creativity-fostering strategies in an educational environment.

Researchers such as Csikszentmihalyi (1988) and Perry-Smith and Shalley (2003) have emphasized creativity as a social process. Given that social relationships are an important feature of an informal or a highly interactive work environment, which most workers are a part of, studying the impact of social relationships on creativity becomes an important potential area for research inquiry (Perry-Smith & Shalley, 2003).

Research on Creativity-Fostering Behaviors in Teachers

Since creativity can be seen as a social process, then a measure of the relationship between teachers and their creativity-fostering behaviors with students may be examined. Soh (2000) created the Creativity-Fostering Teacher Index (CFT Index) to gauge the behaviors of teachers in the classroom. The behavior subscale includes:

1. Encourage students to learn independently (Independence)
2. Have a co-operative, socially integrative style of teaching (Integration)
3. Motivate students to master factual knowledge so they have a solid base for divergent thinking (Motivation)

4. Delay judging students ideas until they have been thoroughly worked out and clearly formulated (Judgment)

5. Encourage flexible thinking (Flexibility)

6. Promote self-evaluation in students (Evaluation)

7. Take students' suggestions and questions seriously (Question)

8. Offer students opportunities to work with a wide range of materials and under many different conditions (Opportunities)

9. Help students to learn to cope with frustration and failure, so they have the courage to try the new and unusual (Frustration) (Cropley, 1997)

The nine behaviors of the CFT Index were chosen from a rich body of creativity-fostering literature. Cropley's third creativity-fostering teacher behavior was conceived from Urban's (1990) work on creative 'components.' Urban analyzed the interactions leading to creativity by distinguishing a number of components that appear to work in harmony toward a creative end. These interactions focus on the person as well as the relationships among the characteristics of the learner and setting. Urban created a creativity interaction model based on six components, each with a set of subcomponents that work together for and in the creative process within a framework of environmental conditions. The first three cognitive components are:

1. General knowledge and a thinking base

2. A specific knowledge base and area-specific skills

3. Divergent thinking and acting

From this research, Cropley adopted the third behavior, "Motivate students to master factual knowledge so they have a solid base for divergent thinking" (Urban, 1990).

The ninth behavior is, "Help students to learn to cope with frustration and failure, so they have the courage to try the new and unusual (Urban, 1990)." It was inspired by yet another component of Urban's creativity interaction model, 'Focusing and task commitment.'

Cropley (2001) introduced the basic idea that personal properties need to be looked at in a differentiated way when considering how to foster the emergence of creativity. He stated, "It is possible to develop a tentative classification of personal properties that are favorable for production of effective novelty according to the ease with which they can be influenced by educational measures" (p. 128). Cropley delineated personal properties that are either difficult or easy to foster. The personal property statements, "Narrow range of interests" and "Domination by immediate stimuli," (p. 130), support Cropley's eighth behavior, "Offer students opportunities to work with a wide range of materials and under many different conditions (p. 128). The first behavior, "Encourage students to learn independently," (p. 129) was derived from another personal property, 'Inner directedness.'

In Cropley's (2001) book, titled *Creativity and Education*, he follows Urban's (1990) model. Urban's model states that, when looking at the cognitive domain, fostering creativity in schoolchildren requires promotion of the 'Ability to plan one's own learning and evaluate progress.' This aspect inspired Cropley's sixth CFT Index teacher creativity-fostering behavior, "Promote self-evaluation in students."

Next, Cropley examined a 'congenial' environment, as coined by Csikszentmihalyi (1996), as an element that is also vital to fostering creativity. Cropley (2001) believes that teachers' goals should not be to produce acclaimed

creative geniuses but individuals who can get ideas, try something new, and take a risk in the microenvironment of the classroom. This environmental aspect instigated Cropley's to list the second behavior, "Have a co-operative, socially integrative style of teaching" (p. 128).

In Chapter 7, *Fostering Creativity in the Classroom*, of Cropley's (2001) previously mentioned book, he states "when teachers and classmates are intolerant of differentness, reject novelty or surprisingness, or impose sanctions against even 'inspired' failures, the effect is to dampen pupils' willingness to depart from the safe and conventional" (p. 149). Cropley suggests that creativity requires the following from the creator: "Knowledge of the social rules and willingness to operate within them" and "Ability to communicate in a way others can understand and accept." This supports Cropley's fourth creativity-fostering teacher behavior, "Delay judging students ideas until they have been thoroughly worked out and clearly formulated." On the part of the social environment, Cropley believes that creativity requires 'Openness and tolerance of variability' and 'Provision of a 'creativogenic' climate.' These support his seventh teacher creativity-fostering behavior, "Take students' suggestions and questions seriously."

Lastly, Cropley included the fifth behavior, "Encourage flexible thinking." The reasoning behind this behavior comes from Cropley's (2001) statement, "Readiness to take risks permits remote associations, [while] playfulness and willingness to experiment go with fluency and flexibility" (p. 148).

Five behavioral manifestation statements were generated for each of the nine behavioral characteristics of creativity-fostering teachers. These statements then

formed the six-point frequency scales for teacher self-report. For example, the behavior "Encourage students to learn independently" (p. 130) was utilized by the statements, 'I encourage students to show me what they have learned on their own,' and, 'I teach students the basics and leave room for individual learning.' Soh's (2000) CFT Index is administered with one statement from one subscale followed by another statement from another of the nine subscales. According to Soh, this avoids the likely response within statements for the same creativity-fostering teacher behavior.

Creative instructional strategies lead to creative student outcomes (Sternberg, 2003), which in turn provide long term benefits such as improved school performance to students. Prior research suggests that the current high-stakes standardized testing environment makes it difficult to keep creativity in the classroom. We next turn the attention to teacher traits and skills required to foster creativity effectively.

Teacher Qualities and Competencies Needed to Foster Creativity

Renzulli (1980) stated that it is not practical to center attention on teacher characteristics. Instead, he suggests that attention should focus on teacher behaviors. Merriam-Webster's Online Dictionary (2007) defines a characteristic as a distinguishing trait, quality, or property, while a behavior is defined as the way in which something functions or operates. A review of the literature concerning the operation of effective teachers reveals that, while different study methodologies were utilized by researchers, every conclusion included a mixture of academic and personality behaviors, competencies and attitudes. These traits have become indicative of teachers who actively employ creativity-fostering teaching strategies and activities both frequently and effectively.

Academic and Personal Behaviors

Angleoska-Galevska (1996) found that certain specific teacher behaviors foster creativity. These include the educator's positive attitude toward creativity, social relations between educator and student, appropriate materials, and the teacher's level of education. It is interesting to note that, within her study, university-trained educators fostered a greater extent of creativity than their non-university trained counterparts. This speaks to one aim of NCLB, which is to identify and reward highly qualified teachers and suggests that districts should continue to increase their number of university-trained educators.

Another study suggests that gifted students often prefer personal behaviors to their teachers' academic qualities. Lewis (1982) worked with small groups of gifted students in 3rd through 7th grade to identify the behaviors of successful teachers of the gifted. The students agreed on a list of 22 essential behaviors, the most important of which included creativity, understanding, patience, and honesty. The majority of items listed related to personal traits of the teacher. Sternberg and Lubart (1991) also identify personality attributes essential in the process of teaching creativity. These include tolerance for ambiguity, willingness to overcoming complications, perseverance, willingness to grow, risk taking, having the courage of individual conviction, and belief in oneself.

Attitudes and Competencies

In addition to personal and academic behaviors, successful creativity-fostering teachers must also be willing and able to foster all of the personal resources their students draw upon in the classroom. In their 'investment theory of creativity'

Sternberg and Lubart (1991) suggest that building creativity in students involves teaching them to use six resources: intelligence, knowledge, intellectual style, personality, motivation, and environmental context. Problem definition is a particularly crucial aspect of the intelligence resource. Teachers must avoid obvious set-up problems in the classroom and instead develop problems that require insightful solutions to real-world, open-ended questions. According to the authors, the successful intelligence resource is achieved by:

> seeing things in a stream of inputs that most people would not see...seeing how to combine disparate pieces of information whose connection is usually non-obvious and usually elusive [and] seeing the non-obvious relevance of old information to a new problem (p. 609).

Sternberg and Lubart (1991, 1995) believe that creativity is not just thinking in a definite manner, but is rather an outlook concerning life and what it has to offer. Sternberg (2000) wrote that creative people make a decision to be creative. In a revision of the key concepts discussed above, Sternberg (2003) purported that the form of teaching for creativity takes twelve key decisions that motivate creative thinking. These decisions include, to name a few, redefining problems and critique and selling your own ideas. He reminds teachers that knowledge is a double-edged sword in that sometimes it can make individuals think they know everything about a domain, and then suffer from closed-mindedness. Sternberg believes that creative people must decide to surmount obstacles, take sensible risks, and have a willingness to grow. Above all, individuals must decide to believe in themselves and tolerate

ambiguity. Truly creative people find what they love to do, and then do it. Teachers must foster these ideas in the classroom.

Perkins (1999) urges teachers to consider their inventory of skills as a 'toolbox' since no one situation in teaching is ever identical to the next. Once teachers have nurtured and developed the qualities and competencies necessary to effectively teach creativity, they must then turn to methods to introduce creativity into their classrooms. A possible starting point for fostering creativity is utilizing informal creative thinking and problem solving activities such as those outlined in the next section of the paper.

Activities That Foster Creativity

Understanding activities that promote creative thinking and problem-solving skills is one approach teachers can employ to counteract the potentially negative effects of high-stakes standardized testing on student creativity. The act of teaching and fostering creativity is diverse, and research reveals that there is an intricate artistry required in teaching (Dadds, 1993, 1995; Halliwell, 1993; Woods & Jeffrey, 1996; Cropley, 2001). The majority of the following strategies allow teachers to implement creativity-fostering activities quickly and frequently, and require little advanced planning or preparation. These environmental considerations and thinking process strategies can allow teachers to foster creativity on a daily basis.

Classroom Environment and Creativity

Environment, or what Rhodes (1961) referred to as 'creative press', is the forth major area of creativity research. The other major areas include creative process, product, and personality, but the main focus of this section is on environment.

Raina and Vats (1979) reflected that creative teachers tend to favor a creative classroom environment. Their study of 60 teachers in India found that highly creative teachers tended to facilitate a sense of empathy, a sense of trust, and discovery in the classroom. Teachers with a lower level of creativity tended to reflect the same low level of creativity in their classroom environment. Raina and Vats discovered solid connections between creative personality, teaching style, and student control beliefs. Creative teachers established classroom environments with less control and an emphasis on less disciplined control. Torrance (1970) described creative teachers as humanistic, accepting, and tolerant in their approach towards the education of their students.

Many creative thinking and problem solving activities are related to the learning environment of the classroom. Shallcross (1981) recognizes an array of strategies she believes to be important in pedagogical advances toward fostering creativity. The first of these includes permitting ample room and time for developing a creative reply to a variety of problematic circumstances. Shallcross implies that educators often intrude prematurely in their students' thinking process. This prevents students from working out ideas. Additionally, she believes that offering an open 'mental climate' in the classroom that fosters self-esteem and self-worth, and valuing the viability of products will enhance student confidence. Also, the classroom's emotional climate must permit student growth in security and personal confidence. Constant scrutiny is a creativity killer in any situation. As Shallcross puts it, "The ground rules are personal guarantees that allow [students] to grow at their own rate,

retain the privacy of their work until they are ready to share it, and prize their possible differences" (p. 19).

The Reggio Emilia Approach for fostering creativity purports environmental classroom modifications to support student creativity. This model considers the environment to be an additional educator. Teachers must organize different areas for minor and major group projects as well as small intimate spaces for individual students. Documentation of student work is displayed in common areas. Shared space is made available for students from different classrooms to work together. Edwards and Springate (1995) suggest that the instructive strategies from this model include many helpful guidelines. Similar to Shallcross, teachers must give students adequate time to finish their work while also offering them the physical space needed to leave work from one day to the next. In addition, rich resource materials are particularly useful when the students themselves participate in the selection process. The model also suggests that teachers should provide a variety of stimulating encounters that help students integrate their 'outer and inner worlds', and have their work become enhanced by the welcoming climate in the classroom.

Student choice can also be an important environmental consideration in fostering creativity. Greenberg (1992) investigated the creativity of fashion design college students and discovered that those students who were more creative had more choice in identifying which problems they were going to work on and took more time in completing their tasks. She also found that such students expressed more positive feelings about their work, which is an important point for school teachers, for it could

be argued that fostering a positive attitude to one's own creativity is an essential starting point for classroom creativity (Sternberg, 2003).

A final strategy related to the classroom-learning environment was advanced by Amabile (1988) and Isaksen (1995) and explores climates that encourage creativity. Their study suggests that participants in a creative climate are challenged by their tasks and goals, and are encouraged to take risks. Consequently, students volunteer new ideas and perspectives freely, and their new ideas are met with support and encouragement. Furthermore, since ambiguity is tolerated in the classroom, students are able to experience debate in an open and status-free environment.

de Souza Fleith (2000) investigated perceptions of elementary classroom environment and its impact on creativity. She sought to determine "perceptions of characteristics that either stimulated or inhibited the development of creativity in the classroom environment" (p. 148). de Souza Fleith interviewed seven public school teachers and held focus group interviews with thirty-one third and fourth grade students. Participants described a classroom environment and identified activities that enabled creativity. They were also asked to define creativity and create a list of criteria used to evaluate a student as creative. She found that teachers believed the school environment was a factor in the development of student creativity. They connected creativity-enhancing environments with student choice, few rules and restrictions, and the need for accepting students for who they are. Teachers also stated that creativity in the classroom was enhanced with open-ended activities, unstructured time, drawing, and flexible directions. The students wanted more time to be spent on the Internet, more field trips, and more adult help in the classroom.

Tomlinson (1995) emphasized that, when differentiating the curriculum, "Teachers are not dispensers of knowledge, but organizers of learning opportunities" (p. 1). She suggested that the classroom environment must accommodate individual learner interests and abilities in order for the most favorable learning to occur. When the environment makes allowances for creativity, students have a greater chance of becoming creative.

When thinking about careers and classroom environment, Albert (1990) suggests that there are many strategies that teachers can take to encourage gifted students without applying pressure for immediate career choice. Teachers can allow for flexibility and novelty when discussing future careers. They can institute unique firsthand experiences in the classroom and can assist with the experience of emotions to the fullest. Expectations of future professions, however, must be grounded in reality.

Grim public and political consequences befall those without appropriate nurturing of creativity. Within each creative person, Gowan (1972) proposed that the development of creation and demolition is strongly linked to one another. The relationship between creation and destruction within creative development was further explored by Lewis (1991). He found that the entirety of a student's educational career is needed to support creativity. Creativity develops along a scale, from creative expression to destructive conduct, when a student cannot express himself or is unsuccessful at developing the ego-strength that appears to typify a productive life. Getzels and Csikszentmihalyi (1977) found that mid-life creative production in adult artists was directly related to problem-finding ability when they

were students. As VanTassel-Baska (1998) suggests, problem-finding ability is connected with creativity, and it comes from training rather than inspiration from one of the nine muses. The implications of these studies are important because they further delineate teacher characteristics in a creative classroom.

Motivation is a Facet of Environment

Sternberg and Lubart (1991) believe in the importance of intrinsic motivation and motivation to excel. They warn that extrinsic motivation can undermine creativity. They suggest that the classroom environment must spark creative ideas, encourage follow-up, offer appropriate evaluations, and offer rewards for creative ideas. Sternberg and Lubart (1991) also suggest that the ideal learner is often characterized by educators as one who conforms, an idea that does not appear to embrace the fostering of student creativity.

Collins and Amabile (1999) conducted a meta-analysis of twenty-five years of creativity and motivation studies. They cited many connections to motivation, such as persistence and passion, but put emphasis on the significance of intrinsic and extrinsic motivation. The researchers stated, "The identification of two types of motivation – one conducive to creativity and one harmful – was a breakthrough in research on the forces driving creativity" (p. 299). Most research on creativity and extrinsic and intrinsic motivation views external reward as non-conducive to both creativity and task interest (Eisenberger & Armeli, 1997).

However, all research does not share the same view. Eisenberger and Armeli (1997) organized a study examining the effects of monetary rewards on over 400 students' creative execution. First, the researchers asked the students to think of

innovative uses for objects. The students were rewarded with large, small, or no monetary rewards. Eisenberger and Armeli (1997) found that the large reward generated a greater creative performance on the drawing of a picture task than a small or no reward. Next, the researchers offered the students a choice of creating original drawings or copying familiar drawings. In this stage of the study, the researchers found that the offering of a significant reward enhanced intrinsic creative attention. They also found that rewarding uncreative performance reduced intrinsic creative interest. Eisenberger and Armeli (1997) concluded, "The explicit requirement of novel performance for salient reward enhances generalized creativity without any loss of intrinsic creative interest" (p. 652).

Thinking Process Strategies

As the above review of the creativity literature suggests, creativity is an important and necessary part of the classroom environment. However, thinking process strategies are equally important.

Creative thinking and problem solving activities involve encouraging students to use specific thinking processes, such as de Bono's (1985) 'six hats' method. He believes that creative thinking is fundamentally 'lateral thinking', and his method encourages student consideration of multiple perspectives of any issue. Students 'wear' one of six hats, each with its own fictional color and permeated with certain qualities. Each hat emphasizes a particular approach to thinking. 'Possibility thinking' is another thinking process strategy which encourages students to approach learning across the curriculum with a 'what if?' attitude (Craft, 2000). Students wonder about

possibilities and are prepared to follow, and be supported in, seeing the questions through to an outcome.

Creativity Lectures and Case Studies

Cropley and Cropley (2000) studied the effects of lectures on creativity and case study with undergraduate students. In their study, they sought to enhance engineering novel-idea production. A product became the final assessment of the study. Cropley and Cropley assigned two groups of students to design and assemble a wheeled-vehicle powered only by the energy stored in a mousetrap. One group received three lectures on creativity complete with creative engineering case studies intermixed with regular lectures. This treatment group also received specific, individual and psychological feedback from creativity test scores of the Urban and Jellen (1996) Test for Creative Thinking – Drawing Production test. The control group only took the test without feedback. Both groups experienced extrinsic motivation by participating in the project for a semester grade. An engineering instructor not associated with the study graded the projects. The researchers concluded that the creativity lectures and case studies had a positive effect on creativity. Cropley and Cropley state, "Upon retesting six weeks later the counseled students were more innovative, whereas the control group was simply less inhibited. In addition, machines constructed by the counseled students were more elegant and creative than those…students who merely attended lectures" (p. 207).

So far in Chapter Two, the investigator has reviewed the literature on teacher qualities and competencies that foster creativity as well as activities which promote student creative behavior. Based on this literature, it seems clear that in order to be

effective, teachers must exhibit intentionality and pre-planning in order to provide students with creative classroom opportunities. Given the limited discretionary classroom time in the NCLB era (Fusarelli, 2004), this would likely prove very difficult to accomplish. Or would it? We now turn our attention to the research surrounding differentiated instruction in gifted education.

Differentiated Instruction in Gifted Education

Differentiated instruction consists of providing opportunities for students to comprehend information, find logic in ideas, and show what they have learned (Tomlinson, 1999). Ward (1961) coined the term differential education for gifted students. He created a standard to pilot curriculum planning to challenge students of various talents. The terms 'differentiated education' and 'differentiated curriculum' became popular as educators embraced these educational opportunities for accelerated students. With the publication of the Marland report (1972), differentiation gained a permanent place in the glossary of education. The report specified that gifted and talented students "require differentiated educational programs and/or services" (p. 2). However, the details of this requirement were not delineated. It allowed educators to fill in the gaps by reexamining previous thoughts or creating original differentiation plans.

Heacox (2002) stated that "Differentiating instruction means changing the pace, level, kind of instruction you provide in response to individual learners' needs, styles, or interests" (p. 5). Differentiation can be described as complex, varied, flexible, relevant and rigorous. To further achievement, teachers should recognize student differences and set appropriate learning goals. Differentiation should focus on

essential learning and align with student choice and demonstration of what was learned. Activities should engage students with the depth and breadth of the curriculum (Heacox, 2002).

Teachers that employ differentiation strategies do so with the principle that students learn within a variety of diverse approaches. For example, Tomlinson (2000) wrote that differentiation is a philosophy established on the following set of beliefs:

- Students who are the same age differ in their readiness to learn, their interests, their styles of learning, their experiences, and their life circumstances.
- The differences in students are significant enough to make a major impact on what students need to learn, the pace at which they need to learn it, and the support they need from teachers and others to learn it well.
- Students will learn best when supportive adults push them slightly beyond where they can work without assistance.
- Students will learn best when they can make a connection between the curriculum and their interests and life experiences.
- Students will learn best when learning opportunities are natural.
- Students are more effective learners when classrooms and schools create a sense of community in which students feel significant and respected.
- The central job of schools is to maximize the capacity of each student.

Tomlinson and Allan (2000) further characterized differentiation "as a teacher's reacting responsively to a learner's needs" and that the "goal of [a] differentiated classroom is maximum student growth and individual success" (p. 4). This characterization infers ownership to differentiation to the field of regular education as well as gifted education, since all learners require growth and individual success. Additionally, Tomlinson (1999, 2001) suggests that teachers apply differentiation through consideration of student characteristics such as readiness (i.e., level of difficulty), interest, and learning profile (i.e., intelligence talent, or learning style). This further reinforces the applicability of differentiation to the broader education environment.

Successful classroom teachers do not differentiate for the students every moment of every day in the classroom. Non-differentiated, whole class lessons should still occur. Differentiation gives opportunities for all students to perform at their individual level as well as develop their own strengths. In *The Differentiated Classroom*, Tomlinson (1999) used a metaphor to liken teaching to an equilateral triangle. The students and the content are the bottom angels of the triangle while the teacher assumes the effective leadership position at the top. The teacher should learn from student experience in order to creative the effective follow-up lesson. Tomlinson believes "if any side goes unattended and gets out of balance with the others, the artfulness is lost" (p.27).

Kaplan (1979) developed a framework for designing or developing curricular options. The principles included:

- allow for in-depth learning of a self-selected topic within an area of study

- develop productive, complex, abstract and/or higher level thinking skills
- encourage the development of products that challenge existing ideas and produce 'new' ideas

Passow (1982) remarked that differentiation is essential for the unique gifts and talents of gifted students to develop. "Teachers responsible for these students must have an appropriate base of knowledge and skills to meet these needs, and should enjoy working with these students" (Coleman & Gallagher, 1995, p. 32).

Later, Kaplan (1986) used content, process, product, and affect as categorical approaches to differentiation. The contents section consisted of what is actually taught. The process was how it was taught, and the product was the substantial end resulting from student appeal and abilities. As a result, Kaplan suggested that these learning experiences are differentiated since they are a match among student needs, abilities, interests, and educational purposes. However, Kaplan stated, "differentiation of curriculum and individualization of the curriculum are not similar. Once the curriculum is differentiated, it needs to be individualized for students" (p. 192).

Teachers and Differentiation

Reis et al's. (1993) Curriculum Compacting Study demonstrated how educators successfully identified those students whose academic needs necessitated curricular modifications. Teachers in their study compacted curriculum to eliminate a large amount of what while ensuring the continuation of suitable skills. Reis stated that teachers were proficient with instructional strategies, but needed assistance with designing or developing curriculum deemed appropriately challenging.

However, both Archambault et al.'s (1993) Classroom Practices Survey and Westberg et al.'s (1993) Classroom Practices Observations found a lack of options for curriculum for third and fourth grade students across the country. Archambault summed up their survey results by stating, "It is clear from the results that teachers in regular third and fourth grade classrooms make only minor modifications in the curriculum and their instruction to meet the needs of gifted students" (p. 115).

Westberg et al.'s (1993) survey included classroom observations that supported their survey results. They concluded, "Despite several years of advocacy and efforts to meet the needs of gifted and talented students in this country...little differentiation in the instructional and curricular practices is provided to gifted and talented students in the regular classroom" (p. 139). In a replication study completed ten years later, Westberg and Daoust (2003) found that teachers' differentiation practices in third and fourth grade classrooms had not changed in the previous ten year period. Even though the teachers from two states chosen for the study experienced more professional development in gifted education than teachers across the country reported ten years ago, it did not appear to be reflected in their classroom practices.

In a study that examined teacher characteristics and behaviors in gifted visual and performing arts, Worley (2006) found that, although teachers rated themselves highly on a measure of differentiated classroom practices, the term 'differentiation' was not recognized by them during study interviews.

Tieso (2005) examined curricular differentiation effects between- and within-class grouping on student achievement. When she used a pre- and posttest measure as

a curriculum-based assessment to calculate student performance, she concluded that the diverse-ability students who received the intervention experienced significantly higher mathematics achievement than those who were not a part of the differentiated instruction.

Hertzog (2004) interviewed third grade gifted students who were learning in a differentiated environment. The answers to these open-ended questions were then examined by the students' teachers. The teachers indicated that their students, when compared to non-gifted students, made their assignments more involved with extra reading and research, and spent more time on activities. The teachers also responded that they felt gifted students tended to respond to activities that matched their level of ability. From these findings, Hertzog suggests that open-ended activities encouraged differentiated learning experiences and persuaded students to work on appropriate ability levels.

Renzulli's (1997) Five Dimensions of Differentiation consist of defining individual dimension goals for a truly differentiated approach. His differentiation goals relate to the following five dimensions:

- content - put more depth into the curriculum through organizing the curriculum concepts and structure of knowledge
- process - use many instructional techniques and materials to enhance and motivate learning styles of students
- product - improve the cognitive development and the students' ability to express themselves

- classroom - enhance the comfort by changing grouping formats and physical area of environment
- teacher - use artistic modification to share personal knowledge of topics related to curriculum as well as personal interests, collections, hobbies, and enthusiasm about issues surrounding content area

Characteristics of Differentiation

Differentiated classrooms, according to Tomlinson (2000) have all of the following characteristics: flexible grouping, student responsibility for their own learning, displayed assignments and scored rubrics, heavy on group work and light on teacher lecture, a variety of responsibilities are encouraged and accepted from students, and frequent teacher/student conference time. Content-based assignments vary per student readiness and pre-determined goals. Easily accessible records of student progress show this goal-setting, achievement of goals, and the scoring of a variety of assignments per topic.

The differentiating teacher must understand the subject matter, appreciate student differences, and have the ability to build upon these differences. Teachers must believe that assessment and instruction are two sides of the differentiating coin, and that they are responsible for the adjustment of content, process, and product in response to student readiness. Finally, a major goal of the differentiated classroom is maximum growth and measurable individual success (Heacox, 2002; Tomlinson, 1999, 2000).

Differentiation and Assessment

Another facet of classroom differentiation includes the assessment of student performance. Riley (1997) suggests that rubrics, portfolios, and checklists must be centered on the student-created result when differentiating.

Tomlinson (1999) also discusses how state standards 'fit' in with differentiated instruction:

> Standards should be a vehicle to ensure that students learn more coherently, more deeply, more broadly and more durably. Sadly, when teachers feel pressure to cover standards in isolation, and when the standards are presented in the form of fragmented and sterile lists, genuine learning is hobbled, not enriched (p. 40).

Gifted and regular education teachers are assigned with the advancement and use of the five components of differentiation. This development must be steadfast and progressive. Educators must direct gifted students into appropriate options that challenge their potential. Differentiation is the fundamental approach that can support gifted students as they "realize their contribution to self and society" (Marland, 1972, p. ix).

Conclusion

The above literature review helps us understand the relevance and importance of encouraging creativity, as well as the necessity of differentiation in the classroom, even in the NCLB era. Intentionally employing creative thinking and problem solving strategies allows teachers to encourage creativity on a daily, informal basis. Studies involving teachers and how they foster creativity secondary education during the

NCLB era must be conducted to shed more light on our understanding of these concepts. Truly integrating creativity in the classroom, however, requires more formalized, in-depth approaches such as differentiated instructional strategies borrowed from gifted education.

Teachers who wish to foster creativity in their classrooms must consider several common themes uncovered in this chapter including the importance of attitude, classroom environment, and high teacher involvement (Amabile, 1983; Csikszentmihalyi, 1996; Edwards and Springate, 1995; Shallcross, 1981). Even in today's world of high-stakes standardized testing, teachers must find ways to include creativity as a part of their daily classroom practice.

Additionally, teachers must be cognizant that not all students will have the same reaction to creative thinking in the classroom. Creative behavior contains a degree of risk, and some creative ideas turn out to be product disappointments. Unsuccessful ventures in creativity can affect student self-esteem. Those students who are averse to taking risks are not likely to see the benefits of teachers fostering creativity and may not be as optimistic towards it (Fernald, 1988; Amabile & Sensabaugh, 1992; Landrum, 1993). In addition to other benefits previously discussed, differentiated instructional strategies would help teachers manage the divergent reactions of their student populations to creativity in the classroom.

Chapter 3: Methodology

The purpose of this chapter is to present the research rationale and design used in this study. An overview of the research strategy is followed by a description of the techniques used to collect and analyze the data.

Purpose of the Study

The central purpose of this exploratory study was to examine secondary creativity-fostering teachers' instructional strategies and behaviors in the current high-stakes standardized testing environment, emphasized by the No Child Left Behind Act of 2001 (NCLB). Soh's (2000) CFT Index and the CFT Index Observation Scale were used to measure classroom behaviors and observations of creativity-fostering behaviors. This study was also designed to examine the factors that impede or facilitate creativity-fostering behaviors in teachers, and the degree to which 9th and 10th grade teachers report the use of creativity-fostering behaviors in their classrooms. Data were collected via teacher surveys, interviews, and classroom observations. For general implications, "exploratory research can be conceived as an attempt to explain variability in the phenomena of interest" (Pedhazur & Schmelkin, 1991, p. 212).

This chapter includes the research design and methodology, the sample population, the instruments, how the study was completed, interpretations and data analysis, the bias of the research, and limitations and delimitations.

Research Questions

The following questions guided the study:

1. To what degree do 9th and 10th grade teachers report the use of creativity-fostering behaviors in the classroom on Soh's CFT Index?
2. What strategies for fostering creativity are implemented by teachers who score in the top 50th percentile of the CFT Index measure?
3. What are the factors that impede or facilitate creativity-fostering behaviors in the teachers who score in the top 50th percentile of the CFT Index measure?

Research Design

Research in the educational field relies on the traditions and perspectives of a variety of disciplines to comprehend and improve upon the professionals involved and the processes used in scholarship and schooling (Creswell, 2002; Gall, Gall, and Borg, 2003). The credibility of mixed methods research has strengthened in the educational field (Creswell, 1994, 2002), and the design incorporates the use of open and closed-ended questions, both quantitative and qualitative. The research design employed in this study was an exploratory mixed method approach. Creswell (2003) defines the sequential exploratory strategy as a method that permits the collection and analysis of data both quantitative and qualitative. The qualitative method will expand on the quantitative. Ultimately, for this study, the investigator decided to "begin with a quantitative method...to be followed by a qualitative method involving detailed exploration with a few cases or individuals" (Creswell, 2002, p.16).

Since the study involved the investigation of phenomena that had been largely unexplored to date, an exploratory research method was preferable in that it would

provide the researcher with a modicum of flexibility when exploring elements of an emergent theory resulting from the qualitative findings.

The primary method of investigating the phenomena of creativity-fostering teacher behaviors in No Child Left Behind classrooms was grounded theory, a qualitative method developed a few decades ago by sociologists Glaser and Strauss (1967). Grounded theory is a qualitative approach that focuses on a specific group of individuals in a specific setting, and their experiences within that setting (Moustakas, 1990) during a certain time period, or zeitgeist. This theory was specifically "designed to aid in the systematic collection and analysis of data and the construction of a theoretical model" (Creswell, 1998, p. 299). Straus and Corbin (1998) suggest: "Theory derived from data is more likely to resemble 'reality' than is theory derived by putting together a series of concepts based on experience or solely through speculation. Grounded theories, because they are drawn from data, are likely to offer insight, enhance understanding, and provide a meaningful guide to action" (p. 12).

In a grounded theory approach, the investigator is responsible for the continual search for connections within the data. The investigator must be cognizant of any and all possibilities in order to establish these connections. Even though the study begins with quantitative data, qualitative data will be used to assist the aggregation and comparison of the data. Gay (1996) stated that the combination of quantitative and qualitative data can enhance a research study, especially when testimonials and /or quotes are used with descriptive statistics. These comments, Gay suggests, make the statistics come alive. Finally, Creswell (2003) states that combining the two types of data "can make a largely qualitative study more palatable

to a quantitative adviser, committee, or research community that may be unfamiliar with the naturalistic tradition" (p. 216).

Procedures for Data Collection

The investigator retrieved data from an individual high school. Permission was obtained from the principal for access to the teachers. The investigator began the research during the fall of the 2007-2008 academic school year. Teachers from 9th and 10th grade English, math, science, and social studies first completed Soh's (2000) CFT Index, a self-report survey. These 9th and 10th grade teacher participants were chosen due to the lack of empirical research at this educational level. Also, these two grades do not take specific standardized tests, such as Virginia's Standards of Learning (SOLs) that both 8th grade and 11th grade students take in March and June of every year. The investigator felt that he would have a better chance of getting into classrooms for observations if those teachers were not under the deadline of a standardized test.

The CFT Index Observation Scale was used to collect qualitative data. Qualitative data on creativity-fostering teacher classroom behaviors were collected through face to face or email interview protocols.

Design Model

Table 1 provides a synthesis of the research questions, instrumentation, procedures, and data analysis. Each question was addressed in a systematic way during the study. The instrumentation for each question is listed. Qualitative and quantitative data analysis techniques were used to provide insight into creativity in

the educational system. This table provides an outline of the research process and methodologies used per research question.

The first question was addressed through data collected from teacher surveys. Data analysis was conducted using descriptive statistics. The second research question was addressed through observation of teachers within their respective classrooms. Data were analyzed through a quantitative method, as the investigator tried to obtain teacher perspectives, and ultimately patterns, of creativity-fostering behaviors in their classroom. The third research question was addressed in the teacher interviews and assessed using a content analysis-based qualitative methodology.

Table 1

Research Questions, Instrumentation, Procedures, and Data Analysis

Research Question	Instrumentation	Procedure	Data Analysis
To what degree do 9th and 10th grade teachers report the use of creativity-fostering behaviors in the classroom on Soh's CFT Index?	Creativity-Fostering Teacher Index (CFT Index)	9th and 10th grade teachers completed the 45-item scale	Descriptive Statistics (Means, Range, Frequency, and Standard Deviation)
What strategies for fostering creativity are implemented by teachers who score in the top 50 percentile of the CFT Index measure?	Soh's CFT Index Observation Scale	Selected classroom teachers that scored within top 50 percentile were observed with Soh's CFT Index Observation Scale	Descriptive Statistics (Means, Range, Frequency, and Standard Deviation)
What are the factors that impede or facilitate creativity-fostering behaviors in the teachers who score in the top 50 percentile of the CFT Index measure?	Interview	Teachers that scored in top 50 percentile of CFT Index were interviewed	Qualitative, content analysis, themes/extractions across interviews

Sample

The sample for this study consisted of twenty teachers from a high school in a large, mid Atlantic suburban school district. Although high schools typically serve secondary students in grades 9 through 12, this study involved only 9th and 10th grade core subject, or English, math, science, and social studies teachers. These 9th and 10th grade teacher participants were chosen due to the lack of empirical research at this educational level. Also, these two grades do not take specific standardized tests, such as Virginia's Standards of Learning (SOLs), that both 8th grade and 11th grade students are assessed with in March and June of every school year. The investigator felt that these classroom teachers could be more generous with observation requests than those teachers who taught 11^{th} and 12^{th} grades and were under the deadline of a standardized test. Two high schools in the same district were initially contacted by email (Appendix A) to take part in the study. Both of the administrators responded to the investigator's initial request. Both were in a position to accommodate the study, but one was chosen for the study based on its larger teacher population size. Table 2 describes the sample of teachers by teaching subject, gender, age, years teaching in current subject, and years with the school and school district.

Thirty one teachers from every 9^{th} and 10^{th} grade core subject in the high school were initially asked to participate in the study by completing Soh's Creativity-Fostering Teacher Index, (CFT Index), a self-report survey (Appendix B). Twenty teachers out of 31 complied, yielding a 65% rate of return. The CFT Index was sent to each participant via the school district's inter-district mail system on October 1^{st}.

Instructions advised the perspective participants to anonymously return the completed survey, demographic sheet, and signed participant letter of consent in the envelope provided to the principal. After each survey was returned, the principal sent them to the investigator via the inter-district mail system.

Teachers who scored within the top 50 percentile (N=10) of the returned CFT Index were asked to participate in face to face, phone, or email interviews with the investigator. They were also asked to allow the investigator into their classrooms for two observations with the CFT Index Observation Scale (Appendix C).

Instrumentation

Creativity-Fostering Teacher Index

The teachers' creativity-fostering behaviors were measured using Soh's (2000) CFT Index (Appendix B). This 45-item self-report survey was based on nine creativity-fostering behaviors identified by Cropley (1997). According to Soh (2000), the validation study of the CFT Index to predict creativity-fostering behaviors is "useful for evaluation and research purposes to obtain an overall index of teachers' creativity fostering behavior...and the Cronbach's alpha coefficient for CFT Index is a high .96" (p. 125). Exploratory factor analysis determined that the nine scales collapse most appropriately into a single factor. All items on the scales were measured using a six-point Likert scale, where six equaled 'all the time' and one equaled 'never.'

More recently, Soh (2007) conducted another study using his CFT Index. All nine subscales had reasonably high reliabilities estimated by Cronbach's alpha coefficients. They varied from a moderate 0.62 (for Motivation) to a high 0.85 (for

Judgment), with a median of 0.80. Soh suggests that this is respectable in view of the small number (5) of items for each subscale.

Observation Scale

Examining creativity-fostering behaviors within the context of Soh's CFT Index Observation Scale (Appendix C) allows the investigator to delineate key creativity-fostering behavior strategy features found within the classroom. The CFT Index Observation Scale is divided into nine subscales: Independence, Integration, Motivation, Judgment, Flexibility, Evaluation, Question, Opportunities, and Frustration. Five corresponding items target each set of specific creativity-fostering teacher behaviors exhibited and observed during classroom instruction. These behaviors focus on research-based best practices in the education field, and will assist the investigator in examining the extent to which teachers implement creativity-fostering behaviors in the classroom. The overall CFT Index Observation Scale had a reasonably high reliability estimated by Cronbach's alpha coefficient (α=.88).

Interview Scale

Part I of the interview in Table 2 concerns the teachers' reflections on the definition of creativity by the public and their personal definition of creativity. Festinger (1957) put forward a theory of cognitive dissonance that offered many original ideas about opinion change after forced compliance. Granted, the investigator's interviews with teachers did not conjure 'forced appliance,' but Festinger, simply put, believed that most interviewees felt obliged to answer a question about personal beliefs with what he or she thought were public beliefs. In

return, when asked about public opinion, the interviewee would, in return, answer with his or her personal belief.

Part II of the interview in Table 2 included questions that asked the teacher participants to describe characteristics and practices of creative teachers and students, or the school culture. Part III of the interview concerned the creativity-fostering behaviors found in 9th and 10th grade classrooms and a personal reflection on the teacher's past experiences with creativity. Guiding questions in each part were adapted from Lynch and Hanson (1998) and Gall et al., (2003). Lynch and Hanson focused on differences in worldview that are associated with cultural beliefs and acculturation. Their research includes cultural competence and the acceptance and respect of differences between cultures. To learn about another's culture, they suggest asking questions with the opening, 'What are your beliefs towards…' 'What would be characteristics and practices of people who…', 'What is your concept of...', and concluding with the question: 'Is your answer the same as others in your culture?' Gall et al., (2003) suggests that, "When posing threatening or sensitive questions, ask the respondent about…behavior…" (p. 247). The investigator believes that some of the participants may not strongly believe in creativity and/or creative students. Therefore, participants will be asked instead to describe their perceived behaviors and characteristics of creativity and creative students. The open-ended teacher interview protocol may be found in Appendix D. Table 2 shows the relationship between the interview questions and the related literature source. The section of the interview protocol where the question may be found is also provided.

Table 2

Table of Specifications for Research Interview Questions

Research Question	Data Source	Instrumentation
1. How do you think the American public defines creativity?	Festinger (1957)	Teacher Interview Protocol Part I
2. How do you personally define creativity in students as demonstrated in classrooms?	Festinger (1957)	Teacher Interview Protocol Part I
3. What are some individual characteristics of teachers considered to foster creativity?	Lynch & Hanson (1998); Gall (2003)	Teacher Interview Protocol Part II
4. What strategies do you use to foster student creativity? Why?	Sternberg & Lubart (1991): Amabile (1988): Csikszentmihalyi (1996)	Teacher Interview Protocol Part II
5. What is the relationship between creativity and learning in the classroom?	Lynch & Hanson (1998); Gall (2003)	Teacher Interview Protocol Part II
6. What do you believe American school systems can do to enhance creativity-fostering?	Lynch & Hanson (1998)	Teacher Interview Protocol Part III
7. Why do you believe that creativity should be fostered in k-12 students?	Lynch & Hanson (1998)	Teacher Interview Protocol Part III
8. What is the relationship between your past experiences and creativity?	Lynch & Hanson (1998)	Teacher Interview Protocol Part III
9. What factors facilitate your ability to foster creativity? In your classroom? In your school?	Angleoska-Galevska (1996); Perkins (1999); Torrance (1962)	Teacher Interview Protocol Part III

Data Analysis Procedures

The categorical data from the teacher self-report instrument, the CFT Index, and the CFT Index Observation Scale were compiled using descriptive statistics, frequencies and percentages. The interview data were coded by investigator-

generated interpretive categories and themes obtained from the study's research questions.

Data Analysis for Classroom Observations

Soh's CFT Index Observation Scale data were analyzed through descriptive statistics. The investigator observed each teacher's classroom behavior according to Soh's nine subscales using the 6-point scale (Appendix C).

Data Analysis for Interviews

The interview data were analyzed through deductive content analysis. Deductive analysis involves analyzing the data according to an existing framework (Patton, 2002). The framework used in this study was Cropley's (1997) nine characteristics of creativity-fostering teacher behaviors. Interpretive coding, or sensitizing concepts, (Patton, 2002) was used to further analyze the data gathered from the teacher interviews. Interpretive coding focused on the study's abstract issues and concerns, such as the subscales titled Independence, Integration, Motivation, Judgment, Flexibility, Evaluation, Question, Opportunities, and Frustration. Both the etic, or outside perspective, and emic, or insider perspectives, were used to understand the practices of teachers with creativity-fostering behaviors. These perspectives were also used to align the behaviors with terms and concepts used in general and gifted education K-12 classrooms.

Codes were listed on index cards from the interview questions and data and were assigned to categories (i.e., Motivation, Opportunities) under the headings of Cropley's creativity-fostering teacher behaviors. Once the data were analyzed, the investigator wrote up the results as part of the study (Creswell, 1994). After

completion, the investigator shared the results with the interview participants for member checking of the information (Appendix O). Requested revisions were made (Creswell, 1994).

This study reflects many of the major elements of the qualitative research tradition. An audit trail and investigator's journal (Appendix N) to support dependability and confirmability of the findings add to standards of trustworthiness (Lincoln & Guba, 1985). The audit trail includes the study's correspondence, instruments, and data. The journal was used to record both thoughts and actions pertaining to the study. The journal also ensured that the investigator's experience with the study of creativity and formal training in education did not skew the findings. The journal allowed the investigator to keep separate the true interpretation of the study's data and the investigator's beliefs and study expectations. Lincoln and Guba (1985) suggest that the triangulation of data through the study's CFT Index self-report survey, interview participants and document analysis support credibility of the findings, and that the journal and purposeful sampling of the study's participants support the transferability or applicability of the findings.

Obtaining new insights of teacher's creativity-fostering behaviors and strategies was the goal of the investigator at this point in the study. Findings are reported in Chapter 4 and implications for future research are delineated within the final chapter of the dissertation.

Data Collection Management

All information from the CTF Index, the CFT Index Observation Scale, and interview protocol were kept in hard copy by the investigator. The categorical data

from the teacher self-report instrument and the CFT Index were compiled using frequencies and percentages. The interview and observation data were coded by investigator-generated interpretive categories and themes obtained from the study's research questions. The teacher participants and the school's principal were given a copy of the research findings.

Researcher Bias

Gall et al., (2003) suggest, "Experimenter bias refers to researchers' expectations about the outcomes of their experiments that are intentionally transmitted to participants so that their subsequent behavior is affected" (p. 379). Some of the study was qualitative, and the investigator was the primary instrument for data collection and analysis. As a current middle school English teacher, the investigator would expect teachers to include creativity-fostering behaviors in their teaching and to value the importance of creativity, even with the current NCLB environment.

Ethical Considerations

The ethical considerations established by the American Psychological Association and Chapter 13, titled Human Research, of the Code of Virginia were followed while conducting this study. The College of William and Mary's School of Education's Human Subject Committee reviewed and approved the procedures of this study prior to its initiation in October of 2007.

In accordance with the National Research Act of 1974, the investigator provided the Human Subjects Committee at The College of William and Mary the opportunity to review this proposal to see if risk elements were apparent. The risks to

the participants in this study were minimal. Risk is defined as exposure to the possibility of physical, psychological, or social injury as a consequence of participating as a subject in research, development, or related activity (Borg & Gall, 1989).

The protection of individual privacy in educational research involves two factors: individual consent of what will be disclosed by the investigator and confidential use of the research data collected (Borg & Gall, 1989). Confidentiality was maintained. No one had access to the data with the exception of the investigator. Also, individual names and institutions were not used in any following publications. All participants were offered an explanation of the research prior to the start, and opportunity to be given results at the conclusion of the study.

Conclusion

In the above chapter, the investigator outlined the research methodology and three research questions. A table, designed to specify how each of the research questions were handled in the study, was put forth. Also defined in this chapter were the research context, sample, and procedures for collecting data and ethical concerns. The investigator described possible biases as well as how these biases were minimized for the sake of study quality.

This research study concerns creativity-fostering behaviors of high school teachers, and it belongs in the research area of creativity and secondary education. The aim was to define a 'snapshot' of creativity-fostering teacher behaviors as they appeared in an educator's pedagogy during the early twenty-first century. A comprehensive and functional analysis of real teaching practices that allows or

disallows for creativity-fostering behaviors is relevant in current education research. It is important to examine how the task of creativity-fostering behaviors is implemented in the context of a secondary education institution.

Chapter 4: Results

Introduction

The purpose of this exploratory study was to examine instructional strategies and behaviors of creativity-fostering, secondary teachers in the high-stakes standardized testing environment, recently emphasized by the No Child Left Behind Act of 2001 (NCLB). This study was also designed to examine the factors that impede or facilitate creativity-fostering behaviors in teachers, and the degree to which 9th and 10th grade teachers report the use of creativity-fostering behaviors in their classrooms. The study was undertaken during the months of October, 2007 through March, 2008. Surveys were distributed to 31 teachers in a local high school. These surveys were delivered through an inter-district mailing system between the investigator's and the participants' schools. Completed participant surveys were anonymously placed in the principal's mail box after all identifying marks located on the outside of the envelope were removed at the request of the investigator. Of the 31 distributed surveys, 30 were returned for a return rate of 97 percent. However, of the returned surveys, only 20 were fully completed, for a usable return rate of 65 percent.

The initial data consisted of results for the teacher self-report survey. However, participants who scored within the 50th percentile of Soh's (2000) Creativity-Fostering Teacher Index (CFT Index) self-report survey were asked to participate in a follow-up interview and agree to two classroom observations. The interviews were conducted face to face and through email correspondence.

Quantitative data from the survey were analyzed using descriptive statistics. The qualitative data from the interviews and observations were analyzed using inductive and interpretive coding and thematic content analysis (Rossman & Rallis, 1998; Patton, 2002; Creswell, 2007).

Core subject (English, math, science, and social studies) teachers of 9th and 10th grade students participated in this study. The teacher self-report surveys were distributed to the teachers in the high school that offered the largest teacher sample. The high school's principal agreed to allow the investigator to distribute the surveys to eligible teachers. Each survey included instructions for the teachers concerning how to return the survey anonymously to the principal. The principal's secretary collected and returned the first-round of 23 returned surveys. A second and third reminder email to the remaining participants resulted in a 97 percent return rate (N=30). Ten survey packets were returned incomplete, with some of the teacher participants explaining their non-participation in the study through notes and emails. Twenty (65%) of the returned packets included a completed CFT Index self-report survey (Appendix B), a signed letter of consent (Appendix F), and a demographics form (Appendix G).

When quantitative analysis was complete, the investigator contacted the ten participants who scored within the 50th percentile of the survey for further study participation. Nine of the participants (90%) agreed to answer interview questions (Appendix D) and partake in two classroom observations with the CFT Index Observation Scale. These observations occurred in early December 2007 and late February 2008.

Report of Findings

Chapter 4 presents the study's results organized by data source and then by research question. The school will be described first to provide contextual information while at the same time maintaining an appropriate level of confidentiality for the school itself and the teacher participants. Next, the sample of teachers will be portrayed through participant responses to the demographic questionnaire and the CFT Index self-report survey. Then, the findings for each data source will be reported. Lastly, each research question will be restated with its relevant findings.

Participant Information

Sixty-five percent of the 31 participants (N=20) completed the demographic form (Appendix G) that accompanied the self-report survey and consent forms. Forty percent (N=8) of the participants were male and sixty percent (N=12) were female. Ninety-five percent (N=19) indicated that they were Caucasian and five percent (N=1) indicated that they were African American. The average age of participants was 39. Six participants indicated that their age was in the 20s, while five participants designated that their age was in the 30s, three specified that their age was in the 40s, five denoted that their age was in the 50s, and one participant listed that his/her age was in the 60s. Table 3 presents these descriptive statistics.

Table 3

Participant Characteristics: Teacher Ethnicity, Gender, and Age

	N=20	*Frequency*	*Percent*
Ethnicity			
African American		1	5%
Caucasian		19	95%
Gender			
Female		12	60%
Male		8	40%

	N	*Mean*	*SD*	*Minimum*	*Maximum*
Age	20	38.90	13.42	21.00	62.00

Teaching Responsibilities

Many of the participants indicated that they were responsible for more than one specific grade level or course. Table 2 offers a summary of the teaching responsibilities of the participants that completed the CFT Index self-report survey and demographic sheet. The sample of participants that completed the CFT Index self-report survey (N=20) included eight teachers who had their primary teaching area in English (40%), four teachers who reported their area as science (20%), seven teachers who reported their area as history (35%), and one teacher that reported his/her area as math (5%).

The majority of teacher participants reported teaching the core subject of English. Social Studies, science, and math were the second, third, and fourth,

respectively, largest core subjects indicated by participants. Eighty percent (N=16) of the participants specified that they worked with 9th grade students. Fifty-five percent (N=11) reported working with students in the 10th grade and thirty-five percent (N=7) participants specified that they additionally taught students in grades 11 and 12. Sixteen teacher participants or 80% of the respondents indicated responsibility for teaching students in the 9th grade. Fifty-five percent (N=11) reported having responsibility for teaching students in the 10th grade. Over half of the participants (N=15) or 75% indicated that they were responsible for teaching students throughout 9th, 10th, 11th, and 12th grade.

The highest levels of participant teaching experience were in the 2 – 5, 6 – 10, and 20+ years ranges. Thirty percent, or (N=6), have taught 2 – 5 years, while 25%, or (N=5) indicated the 6 – 10 and 20+ year ranges. Fifteen percent, or (N=3) of the participants reported that they have taught for 0 – 1 years, and 5%, or (N=1), stated that they have been teaching for 16 – 20 years. None of the participants fell in to the 10 – 15 years of teaching range. Table 4 shows these descriptive statistics for participant content area, grade level, and years of teaching experience.

Table 4

Participant Characteristics: Teaching Responsibilities by Content Area and Grade Level and Teaching Experience

Teaching Responsibility by Content Area	*N=20*	*Frequency*	*Percent*
English		8	40%
Social Studies		7	35%
Science		4	20%
Math		1	5%
Teaching Responsibility by Grade Level	*N=20*	*Frequency*	*Percent*
Grade 9		16	80%
Grade 10		11	55%
Grade 11		5	45%
Grade 12		3	40%
Teaching Experience in Years	*N=20*	*Frequency*	*Percent*
0-1		3	15%
2-5		6	30%
6-10		5	25%
10-15		0	0%
16-20		1	5%
20+		5	25%

Education and training

Seven participants (35%) reported receiving a four-year bachelor's degree. Thirteen participants (65%) noted that they had earned a master's degree. Two participants indicated that their master's degree was in Teaching (MAT), and another reported that he/she earned a MFA degree in theatre. Table 5 presents these descriptive statistics.

Table 5

Participant Education Levels

	N=20	*Frequency*	*Percent*
BA/BS		7	35%
MA/MS		13	65%
Ed.D/Ph.D		0	0%
Educational Specialist		0	0%
Other		0	0%

CFT Index Self Report Findings

Teacher Self-Report Behaviors

The first section of Soh's (2000) Creativity Fostering Teacher Index (CFT Index) self-report survey asked participants to rate their behaviors when teaching their 9th and 10th grade students. The participants were asked to assign a rating, from a 6 point scale, to each behavior statement. An indication of 6 meant 'All the Time'; while 5 indicated that the teacher displayed the behavior 'Almost All the Time.' A mark under the number 4 specified 'Sometimes', and 3 identified an 'Intermittently'

shown teacher behavior. A check under the number 2 designated that the teacher 'Rarely' showed the behavior and an indication of the number 1 revealed that the teacher behavior occurred 'Not at All.' Twenty of the thirty-one participants answered all 45 items of the survey.

Table 6 provides descriptive statistics for each item in the CFT Index. Mean scores, and a measure of central tendency are provided across all 20 participants. Standard deviation is provided to serve as a measure of variability in the data. In order to answer Research Question One, the data in Table 6 were sorted based on high, medium, and low criteria. This process is explained following the table.

Table 6

Descriptive Statistics for CFT Index Results, Survey Responses

Item *N=20*	*Mean*	*SD*	*Minimum*	*Maximum*
17. When my students put what they've learnt into different uses, I appreciate them.	5.50 (H)	0.69	4.00	6.00
16. When my students have questions to ask, I listen to them carefully.	5.40 (H)	0.60	4.00	6.00
2. In my class, students have opportunities to share ideas and views.	5.30 (M)	0.73	4.00	6.00
5. In my class, I probe students' ideas to encourage thinking.	5.30 (M)	0.86	3.00	6.00
18. I help students who experience failure to cope with it so that they regain their confidence.	5.25 (M)	0.79	3.00	6.00
29. I encourage students to ask questions and make suggestions in my class.	5.25 (M)	0.72	4.00	6.00
3. Learning the basic knowledge/skills well is emphasized in my class.	5.20 (M)	0.83	3.00	6.00
14. I encourage my students to ask questions freely even if they appear irrelevant.	5.15 (M)	1.04	2.00	6.00
21. My students know that I expect them to learn the basic knowledge and skills well.	5.15 (M)	0.87	3.00	6.00
43. I listen patiently when my students ask	5.15	0.74	4.00	6.00

questions that may sound silly.	(M)			
9. My students who are frustrated can come to me for emotional support.	5.10 (M)	0.85	3.00	6.00
38. Students in my class are expected to co-operatively work in groups.	5.10 (M)	1.02	3.00	6.00
44. Students are allowed to go beyond what I teach them within my subject.	5.10 (M)	0.64	4.00	6.00
23. I encourage my students to think in different directions even if some of the ideas might not work.	5.05 (M)	0.76	4.00	6.00
7. I follow up on my students' suggestions so that they know I take them seriously.	5.00 (M)	0.86	4.00	6.00
12. I emphasize the importance of mastering the essential knowledge and skills.	5.00 (M)	0.79	3.00	6.00
13. When my students suggest something, I follow it up with questions to make them think further.	5.00 (M)	0.79	4.00	6.00
1. I encourage students to show me what they have learned on their own.	4.95 (M)	1.05	2.00	6.00
20. Students in my class are encouraged to contribute to the lesson with their ideas and suggestions.	4.95 (M)	1.10	2.00	6.00
25. My students know that I do not dismiss their suggestions lightly.	4.90 (M)	0.85	3.00	6.00
35. I don't mind my students trying out their own ideas and deviating from what I have shown them.	4.90 (M)	0.97	3.00	6.00
45. I encourage students who experienced failure to find other possible solutions.	4.90 (M)	0.72	4.00	6.00
34. I listen to my students' suggestions even if they are not practical or useful.	4.85 (M)	0.93	3.00	6.00
11. Students in my class have opportunities to do group work regularly.	4.80 (M)	1.15	3.00	6.00
30. Moving from one topic to the next quickly is not my main concern in class.	4.80 (M)	1.32	2.00	6.00
32. I like my students to take time to think in different ways.	4.80 (M)	1.05	3.00	6.00
39. Covering the syllabus is not more important to me than making sure the students learn the basics well.	4.70 (M)	1.08	3.00	6.00
26. My students are encouraged to do different things with what they have learned in class.	4.65 (M)	0.81	3.00	6.00
37. I leave open-ended questions for my students to find the answers for	4.65 (M)	0.99	3.00	6.00

themselves.				
22. I do not give my view immediately on students' ideas, whether I agree or disagree with them.	4.60 (M)	0.99	3.00	6.00
28. I teach students the basics and leave room for individual learning.	4.60 (M)	0.82	3.00	6.00
27. I help my students to draw lessons from their own failures.	4.55 (M)	0.89	3.00	6.00
36. I encourage students who have frustration to take it as part of the learning process.	4.55 (M)	0.76	3.00	6.00
8. I encourage my students to try out what they have learned from me in different situations.	4.50 (M)	1.05	2.00	6.00
31. I comment on students' ideas only after they have been more thoroughly explored.	4.50 (M)	0.94	3.00	6.00
4. When my students have some ideas, I get them to explore further before I take a stand.	4.45 (M)	0.83	3.00	6.00
19. I leave questions for my students to find out for themselves.	4.40 (M)	0.99	3.00	6.00
33. In my class, students have opportunities to judge for themselves whether they are right or wrong.	4.40 (M)	0.88	3.00	6.00
24. My students know that I expect them to check their own work before I do.	4.35 (M)	1.04	2.00	6.00
40. I encourage students to do things differently although doing this takes up more time.	4.20 (M)	0.89	3.00	6.00
6. I expect my students to check their own work instead of waiting for me to correct them.	4.15 (M)	1.35	2.00	6.00
15. I provide opportunities for my students to share their strong and weak points with the class.	3.95 (L)	0.94	2.00	6.00
42. I allow my students to show one another their work before submission.	3.55 (L)	1.43	1.00	6.00
41. I allow students to deviate from what they are told to do.	3.45 (L)	1.28	1.00	6.00
10. I teach my students the basics and leave them to find out more for themselves.	3.20 (L)	1.28	1.00	6.00

(H)=high, (M)=moderate, (L)=low

The criterion for determining high or low results in the mean column of Table 6 was based upon adding or subtracting the composite measure standard deviation (.64) to or from the composite measure mean (4.74).

Using this process, the investigator determined that high items were those with a mean score of 5.38 and above, moderate items were those with a mean score between 4.11 and 5.37, and low items were those with a mean score of 4.10 and below. Based on this approach, two items were particularly high including "When my students have questions to ask, I listen to them carefully" with a mean score of 5.40 and "When my students put what they've learnt into different uses, I appreciate them" with a mean score of 5.50. Thirty-nine items fell in the moderate range including "My students know that I do not dismiss their suggestions lightly" with a mean score of 4.90 and "I comment on students' ideas only after they have been more thoroughly explored" with a mean score of 4.50. Four items were particularly low including "I teach my students the basics and leave them to find out more for themselves" with a score of 3.20, "I provide opportunities for my students to share their strong and weak points with the class" with a score of 3.95, "I allow students to deviate from what they are told to do" with a score of 3.45, and "I allow my students to show one another their work before submission" with a score of 3.55. Finally, although the total range of actual scores was 1.00 to 6.00, all mean scores fell between 3.20 and 5.50.

Similarly, the criterion for determining high or low results in the standard deviation column was based upon adding or subtracting 50% of the composite measure standard deviation (.32) to the composite measure standard deviation (.64). Using this process, the investigator determined that items of high variability were

those with a standard deviation of .96 and above, moderate items were those with a standard deviation between .33 and .95, and low items were those with a standard deviation of .32 and below. Based on this approach, 18 items were particularly highly variable in response including "I encourage students to show me what they have learned on their own" with a standard deviation of 1.05 and "I expect my students to check their own work instead of waiting for me to correct them" with a standard deviation of 1.35. Twenty seven items were moderately variable including "I follow up on my students' suggestions so that they know I take them seriously" with a standard deviation of .86 and "When my students have some ideas, I get them to explore further before I take a stand" with a standard deviation of .83. Based on the criterion set, there were no items with particularly low variability.

Table 7 provides a frequency distribution of the responses by item. This format allows the investigator to see the level of consensus among participants for each item. In addition to nominal data, percentage data are also presented in the table.

Table 7

Frequency Distribution of CFT Index Results, Survey Responses

Item	*N=20*	*6*	*5*	*4*	*3*	*2*	*1*
1. I encourage students to show me what they have learned on their own.		7 (.35)	7 (.35)	5 (.25)	0 (.00)	1 (.05)	0 (.00)
2. In my class, students have opportunities to share ideas and views.		9 (.45)	8 (.40)	3 (.15)	0 (.00)	0 (.00)	0 (.00)
3. Learning the basic knowledge/ skills well is emphasized in my class.		8 (.40)	9 (.45)	2 (.10)	1 (.05)	0 (.00)	0 (.00)
4. When my students have some ideas, I get them to explore further before I take a stand.		2 (.10)	7 (.35)	9 (.45)	2 (.10)	0 (.00)	0 (.00)

5. In my class, I probe students' ideas to encourage thinking.	10 (.50)	7 (.35)	2 (.10)	1 (.05)	0 (.00)	0 (.00)
6. I expect my students to check their own work instead of waiting for me to correct them.	4 (.20)	4 (.20)	6 (.30)	3 (.15)	3 (.15)	0 (.00)
7. I follow up on my students' suggestions so that they know I take them seriously.	7 (.35)	6 (.30)	7 (.35)	0 (.00)	0 (.00)	0 (.00)
8. I encourage my students to try out what they have learned from me in different situations.	2 (.10)	11 (.55)	3 (.15)	3 (.15)	1 (.05)	0 (.00)
9. My students who are frustrated can come to me for emotional support.	7 (.35)	9 (.45)	3 (.15)	1 (.05)	0 (.00)	0 (.00)
10. I teach my students the basics and leave them to find out more for themselves.	1 (.05)	2 (.10)	5 (.25)	5 (.25)	6 (.30)	1 (.05)
11. Students in my class have opportunities to do group work regularly.	7 (.35)	6 (.30)	3 (.15)	4 (.20)	0 (.00)	0 (.00)
12. I emphasize the importance of mastering the essential knowledge and skills.	5 (.25)	11 (.55)	3 (.15)	1 (.05)	0 (.00)	0 (.00)
13. When my students suggest something, I follow it up with questions to make them think further.	6 (.30)	8 (.40)	6 (.30)	0 (.00)	0 (.00)	0 (.00)
14. I encourage my students to ask questions freely even if they appear irrelevant.	9 (.45)	7 (.35)	3 (.15)	0 (.00)	1 (.05)	0 (.00)
15. I provide opportunities for my students to share their strong and weak points with the class.	1 (.05)	4 (.20)	9 (.45)	5 (.25)	1 (.05)	0 (.00)
16. When my students have questions to ask, I listen to them carefully.	9 (.45)	10 (.50)	1 (.05)	0 (.00)	0 (.00)	0 (.00)
17. When my students put what they've learnt into different uses, I appreciate them.	12 (.60)	6 (.30)	2 (.10)	0 (.00)	0 (.00)	0 (.00)
18. I help students who experience failure to cope with it so that they regain their confidence.	8 (.40)	10 (.50)	1 (.05)	1 (.05)	0 (.00)	0 (.00)
19. I leave questions for my students to find out for themselves.	3 (.15)	6 (.30)	7 (.35)	4 (.20)	0 (.00)	0 (.00)
20. Students in my class are encouraged to contribute to the	7 (.35)	8 (.40)	3 (.15)	1 (.05)	1 (.05)	0 (.00)

lesson with their ideas and suggestions.						
21. My students know that I expect them to learn the basic knowledge and skills well.	8 (.40)	8 (.40)	3 (.15)	1 (.05)	0 (.00)	0 (.00)
22. I do not give my view immediately on students' ideas, whether I agree or disagree with them.	4 (.20)	7 (.35)	6 (.30)	3 (.15)	0 (.00)	0 (.00)
23. I encourage my students to think in different directions even if some of the ideas might not work.	6 (.30)	9 (.45)	5 (.25)	0 (.00)	0 (.00)	0 (.00)
24. My students know that I expect them to check their own work before I do.	2 (.10)	8 (.40)	6 (.30)	3 (.15)	1 (.05)	0 (.00)
25. My students know that I do not dismiss their suggestions lightly.	5 (.25)	9 (.45)	5 (.25)	1 (.05)	0 (.00)	0 (.00)
26. My students are encouraged to do different things with what they have learned in class.	3 (.15)	8 (.40)	8 (.40)	1 (.05)	0 (.00)	0 (.00)
27. I help my students to draw lessons from their own failures.	3 (.15)	7 (.35)	8 (.40)	2 (.10)	0 (.00)	0 (.00)
28. I teach students the basics and leave room for individual learning.	3 (.15)	7 (.35)	9 (.45)	1 (.05)	0 (.00)	0 (.00)
29. I encourage students to ask questions and make suggestions in my class.	8 (.40)	9 (.45)	3 (.15)	0 (.00)	0 (.00)	0 (.00)
30. Moving from one topic to the next quickly is not my main concern in class.	7 (.35)	8 (.40)	1 (.05)	2 (.10)	2 (.10)	0 (.00)
31. I comment on students' ideas only after they have been more thoroughly explored.	3 (.15)	7 (.35)	7 (.35)	3 (.15)	0 (.00)	0 (.00)
32. I like my students to take time to think in different ways.	7 (.35)	4 (.20)	7 (.35)	2 (.10)	0 (.00)	0 (.00)
33. In my class, students have opportunities to judge for themselves whether they are right or wrong.	2 (.10)	7 (.35)	8 (.40)	3 (.15)	0 (.00)	0 (.00)
34. I listen to my students' suggestions even if they are not practical or useful.	6 (.30)	6 (.30)	7 (.35)	1 (.05)	0 (.00)	0 (.00)
35. I don't mind my students trying out their own ideas and deviating from what I have shown them.	7 (.35)	5 (.25)	7 (.35)	1 (.05)	0 (.00)	0 (.00)

36. I encourage students who have frustration to take it as part of the learning process.	2 (.10)	8 (.40)	9 (.45)	1 (.05)	0 (.00)	0 (.00)
37. I leave open-ended questions for my students to find the answers for themselves.	4 (.20)	8 (.40)	5 (.25)	3 (.15)	0 (.00)	0 (.00)
38. Students in my class are expected to co-operatively work in groups.	9 (.45)	6 (.30)	3 (.15)	2 (.10)	0 (.00)	0 (.00)
39. Covering the syllabus is not more important to me than making sure the students learn the basics well.	6 (.30)	5 (.25)	6 (.30)	3 (.15)	0 (.00)	0 (.00)
40. I encourage students to do things differently although doing this takes up more time.	2 (.10)	4 (.20)	10 (.50)	4 (.20)	0 (.00)	0 (.00)
41. I allow students to deviate from what they are told to do.	2 (.10)	1 (.05)	6 (.30)	7 (.35)	3 (.15)	1 (.05)
42. I allow my students to show one another their work before submission.	1 (.05)	5 (.25)	5 (.25)	4 (.20)	3 (.15)	2 (.10)
43. I listen patiently when my students ask questions that may sound silly.	7 (.35)	9 (.45)	4 (.20)	0 (.00)	0 (.00)	0 (.00)
44. Students are allowed to go beyond what I teach them within my subject.	5 (.25)	12 (.60)	3 (.15)	0 (.00)	0 (.00)	0 (.00)
45. I encourage students who experienced failure to find other possible solutions.	4 (.20)	10 (.50)	6 (.30)	0 (.00)	0 (.00)	0 (.00)

Responses to the CFT Index were based on a six-point Likert scale. Values of 1-2 may be considered low, 3-4 may be considered medium, and 5-6 may be considered high on this scale. In the above Table 7, the majority of items have frequency distributions concentrated in the mid-high (4) to high (5-6) range. This suggests that most respondents reported engaging in the behaviors studied through the CFT Index. The investigator therefore established a criterion for determining high, moderate, or low results in the frequency distribution table based upon items having

distributions which seemed to be unusual, or somehow departed from the norm. High results were determined to be those items having distributions which skewed even more severely than most to the upper end of the response scale, such as "In my class, I probe students' ideas to encourage thinking" and "When my students put what they've learnt into different uses, I appreciate them." Moderate results were determined to be those with distributions most similar to the majority of items, such as "I leave open-ended questions for my students to find the answers for themselves" and "Students in my class are expected to co-operatively work in groups." Low results were determined to be those items having distributions which were distributed more normally, with a majority of responses in the medium range of the scale, such as "I expect my students to check their own work instead of waiting for me to correct them", "I teach my students the basics and leave them to find out more for themselves", "I allow students to deviate from what they are told to do", and "I allow my students to show one another their work before submission."

CFT Index Results by Subscale

As mentioned earlier, Soh's CFT Index self-report survey items can be grouped into nine theoretically derived subscales. Table 8 provides descriptive statistics for each subscale in the CFT Index. Mean scores are provided across all 20 participants, and the standard deviation serves as a measure of variability in the data. Minimum and maximum scores for each item are also listed. Since Soh determined in his factor analysis that the nine subscales collapse into a single, higher order factor, statistics are also provided for the composite measure. The measure consists of all 45 items.

Table 8

Descriptive Statistics for CFT Index Results, Survey Responses by Subscale

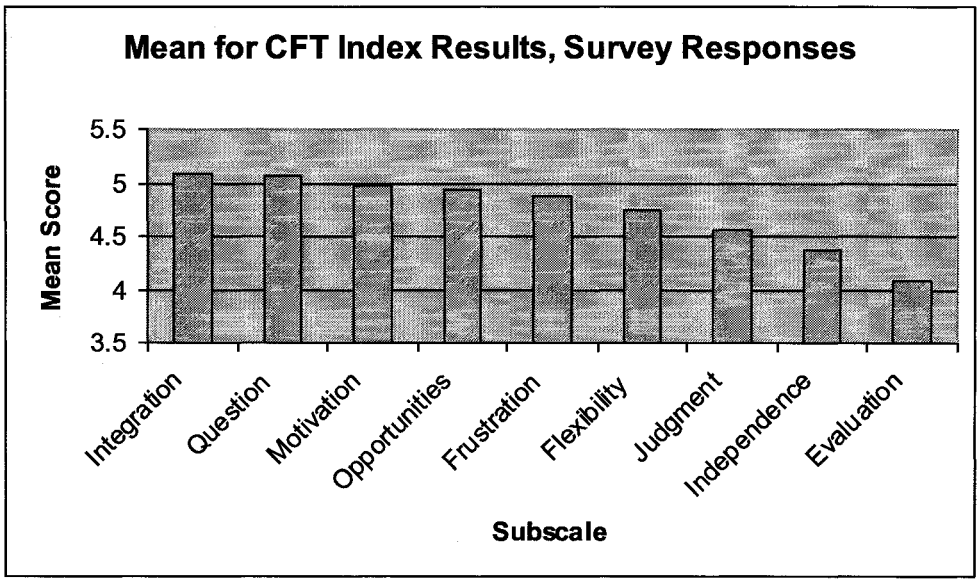
Subscale *N=20*	*Mean*	*SD*	*Minimum*	*Maximum*
Integration	5.08 (M)	0.60	4.00	6.00
Question	5.06 (M)	0.55	4.00	6.00
Motivation	4.97 (M)	0.68	3.80	6.00
Opportunities	4.93 (M)	0.61	4.00	6.00
Frustration	4.87 (M)	0.61	3.80	6.00
Flexibility	4.75 (M)	0.66	3.80	6.00
Judgment	4.55 (M)	0.61	3.40	6.00
Independence	4.36 (M)	0.70	3.20	5.60
Evaluation	4.08 (L)	0.73	2.60	5.60
Composite Measure	4.74	.64	3.62	5.91

(H)=high, (M)=moderate, (L)=low

Figure 1 displays the same information as Table 8, but in bar graph form. It provides descriptive statistics for each subscale in the CFT Index. Mean scores are provided across all 20 participants, and the standard deviation serves as a measure of variability in the data.

Figure 1

Descriptive Statistics for CFT Index, Survey Responses by Subscale



Using the same criteria as Table 6 above, high subscales were those with a mean score of 5.38 and above, moderate subscales were those with a mean score between 4.11 and 5.37, and low subscales were those with a mean score of 4.10 and below. The results displayed in Table 8 demonstrate that eight of the nine subscales fall in the moderate range while one subscale falls in the low range. The highest mean score results are concentrated in the Integration and Question subscales while the lowest mean score results are concentrated in the Independence and Evaluation subscales. The highest variability is evidenced in the Independence and Evaluation subscales while the lowest variability is evidenced in the Integration and Question subscales.

Table 9 provides a frequency distribution of the responses by subscale. This format allows the investigator to see the level of consensus among participants at the

subscale level. Frequency data were also provided for the composite measure. In addition to nominal data, percentage data were also presented in the table.

Table 9

Frequency Distribution of CFT Index Results, Survey Responses by Subscale

Item	*N=20*	*6*	*5*	*4*	*3*	*2*	*1*
Independence		18 (.18)	30 (.30)	31 (.31)	13 (.13)	7 (.07)	1 (.01)
Integration		40 (.40)	37 (.37)	15 (.15)	7 (.07)	1 (.01)	0 (.00)
Motivation		34 (.34)	41 (.41)	15 (.15)	8 (.08)	2 (.02)	0 (.00)
Judgment		17 (.17)	33 (.33)	38 (.38)	12 (.12)	0 (.00)	0 (.00)
Flexibility		34 (.34)	28 (.28)	23 (.23)	10 (.10)	4 (.04)	1 (.01)
Evaluation		10 (.10)	28 (.28)	34 (.34)	18 (.18)	8 (.08)	2 (.02)
Question		34 (.34)	40 (.40)	24 (.24)	2 (.02)	0 (.00)	0 (.00)
Opportunities		29 (.29)	42 (.42)	23 (.23)	5 (.05)	1 (.01)	0 (.00)
Frustration		24 (.24)	44 (.44)	27 (.27)	5 (.05)	0 (.00)	0 (.00)
Composite Measure		240 (.27)	323 (.36)	230 (.26)	80 (.08)	23 (.03)	4 (.00)

As mentioned above, the majority of responses to this scale are concentrated in the mid-high (4) to high (5-6) range. The results displayed in Table 9 demonstrate that the distributions of the Integration and Question subscales appear to skew most heavily to the high end of the Likert scale. Conversely, the distributions of the Independence, Judgment, and Evaluation subscales appear to most closely approximate a normal distribution and thus represent the lowest results among these respondents.

Teacher Selection for Observations

Descriptive statistics were run to find the mean total and standard deviation for each of the participants that completed the CFT Index self-report study. For this study, the participants who scored within the 50th percentile of the self-report survey were invited to allow the investigator into their classrooms for two observations. According to the descriptive statistics for the data (Table 18, Appendix H), teachers numbered 1, 3, 4, 5, 6, 7, 8, 10, 11, and 12 were asked to participate in the observation portion of the study.

Table 11, Appendix I, provides the frequency distribution of data from the self-report survey responses of all participants. The results demonstrate the variability existent in the frequency distributions of responses between participants in the study. Individual frequency distributions range from those which most closely approximate a normal distribution, such as those of teachers 5 and 10 to those which appear very highly skewed to the high end of the response scale, such as those of teachers 11 and 12.

CFT Index Results, Across Both Observations

The first observation of the participants (N=9) occurred during the month of December shortly before, on the same day, or a few days after the interview. The second observation of the participants (N=9) occurred during the latter half of the month of February. Recognizing that the sample is very small and therefore lacking in statistical power, informational descriptive statistics are provided offering some insight into central tendency, variability, and range in the data. During the

observation process, some items were not observed at all (resulting in a zero score assignment) or were observed extremely infrequently, resulting in very low scores.

Table 10 provides the compilation of results across two observations for the nine teachers observed. Additional tables in Appendix M also provide these same data by individual observation time rather than collapsed across observations. In order to answer Research Question Two, *"What strategies for fostering creativity are implemented by teachers who score in the top 50th percentile of the CFT Index measure?"*, the data in Table 10 were sorted based on high, medium, and low scores.

Table 10

Descriptive Statistics for CFT Index Results, Across Both Observations

Item *N=9*	*Mean*	*SD*	*Minimum*	*Maximum*
16. When my students have questions to ask, I listen to them carefully.	6.00 (H)	0.00	6.00	6.00
34. I listen to my students' suggestions even if they are not practical or useful.	5.83 (H)	0.35	5.00	6.00
7. I follow up on my students' suggestions so that they know I take them seriously.	5.67 (H)	1.00	3.00	6.00
25. My students know that I do not dismiss their suggestions lightly.	5.22 (H)	1.28	3.00	6.00
2. In my class, students have opportunities to share ideas and views.	5.17 (H)	1.32	3.00	6.00
14. I encourage my students to ask questions freely even if they appear irrelevant.	4.67 (H)	2.00	0.00	6.00
29. I encourage students to ask questions and make suggestions in my class.	4.67 (H)	2.18	0.00	6.00
21. My students know that I expect them to learn the basic knowledge and skills well.	4.61 (H)	2.15	0.00	6.00
5. In my class, I probe students' ideas to encourage thinking.	4.22 (H)	2.59	0.00	6.00
1. I encourage students to show me what they have learned on their own.	4.17 (H)	1.54	2.50	6.00
20. Students in my class are encouraged to contribute to the lesson with their ideas and suggestions.	3.94 (M)	2.07	0.00	6.00

13. When my students suggest something, I follow it up with questions to make them think further.	3.89 (M)	2.52	0.00	6.00
43. I listen patiently when my students ask questions that may sound silly.	3.83 (M)	2.47	0.00	6.00
11. Students in my class have opportunities to do group work regularly.	3.61 (M)	2.42	0.00	6.00
30. Moving from one topic to the next quickly is not my main concern in class.	3.22 (M)	2.06	0.00	6.00
12. I emphasize the importance of mastering the essential knowledge and skills.	3.17 (M)	2.62	0.00	6.00
17. When my students put what they've learnt into different uses, I appreciate them.	3.00 (M)	2.60	0.00	6.00
3. Learning the basic knowledge/skills well is emphasized in my class.	2.94 (M)	2.04	0.00	6.00
38. Students in my class are expected to co-operatively work in groups.	2.78 (M)	2.82	0.00	6.00
8. I encourage my students to try out what they have learned from me in different situations.	2.56 (M)	2.34	0.00	6.00
28. I teach students the basics and leave room for individual learning.	2.44 (M)	2.57	0.00	6.00
23. I encourage my students to think in different directions even if some of the ideas might not work.	2.28 (M)	1.30	0.00	3.00
22. I do not give my view immediately on students' ideas, whether I agree or disagree with them.	2.17 (M)	2.32	0.00	6.00
32. I like my students to take time to think in different ways.	2.11 (M)	1.95	0.00	6.00
44. Students are allowed to go beyond what I teach them within my subject.	2.00 (M)	2.60	0.00	6.00
31. I comment on students' ideas only after they have been more thoroughly explored.	1.94 (M)	2.10	0.00	6.00
39. Covering the syllabus is not more important to me than making sure the students learn the basics well.	1.89 (M)	2.42	0.00	6.00
40. I encourage students to do things differently although doing this takes up more time.	1.83 (M)	2.35	0.00	6.00
10. I teach my students the basics and leave them to find out more for themselves.	1.56 (M)	2.11	0.00	6.00
37. I leave open-ended questions for my	1.56	1.49	0.00	3.00

students to find the answers for themselves.	(M)			
26. My students are encouraged to do different things with what they have learned in class.	1.33 (M)	1.58	0.00	3.00
4. When my students have some ideas, I get them to explore further before I take a stand.	1.28 (M)	1.52	0.00	3.00
6. I expect my students to check their own work instead of waiting for me to correct them.	0.94 (L)	1.42	0.00	3.00
18. I help students who experience failure to cope with it so that they regain their confidence.	0.94 (L)	1.42	0.00	3.00
19. I leave questions for my students to find out for themselves.	0.89 (L)	1.34	0.00	3.00
24. My students know that I expect them to check their own work before I do.	0.67 (L)	1.32	0.00	3.00
41. I allow students to deviate from what they are told to do.	0.67 (L)	1.32	0.00	3.00
42. I allow my students to show one another their work before submission.	0.56 (L)	1.13	0.00	3.00
9. My students who are frustrated can come to me for emotional support.	0.50 (L)	1.06	0.00	3.00
15. I provide opportunities for my students to share their strong and weak points with the class.	0.33 (L)	1.00	0.00	3.00
27. I help my students to draw lessons from their own failures.	0.28 (L)	0.83	0.00	2.50
33. In my class, students have opportunities to judge for themselves whether they are right or wrong.	0.28 (L)	0.83	0.00	2.50
45. I encourage students who experienced failure to find other possible solutions.	0.22 (L)	0.67	0.00	2.00
35. I don't mind my students trying out their own ideas and deviating from what I have shown them.	0.00 (L)	0.00	0.00	0.00
36. I encourage students who have frustration to take it as part of the learning process.	0.00 (L)	0.00	0.00	0.00

(H)=high, (M)=moderate, (L)=low

The criterion for determining high or low results in the mean column of Table 10 was based upon adding or subtracting the composite measure standard deviation

(1.41) to or from the composite measure mean (2.54). Using this process, the investigator determined that high items were those with a mean score of 3.95 and above, moderate items were those with a mean score between 1.14 and 3.94, and low items were those with a mean score of 1.13 and below. Based on this approach, ten items were particularly high, including "I follow up on my students' suggestions so that they know I take them seriously" with a mean score of 5.67 and "I listen to my students' suggestions even if they are not practical or useful" with a mean score of 5.83. Twenty-two items were found to be moderate, including "When my students suggest something, I follow it up with questions to make them think further" with a mean score of 3.89 and "I teach students the basics and leave room for individual learning" with a mean score of 2.44. Thirteen items were found to be particularly low, including "When my students have questions to ask, I listen to them carefully" with a mean score of zero and "When my students put what they've learnt into different uses, I appreciate them" with a mean score of zero also. Mean scores of zero reflect the lack of opportunity for the investigator to observe that specific phenomenon during the scope of two one-hour observations.

Similarly, the criterion for determining high, moderate, or low results in the standard deviation column was based upon adding or subtracting 50% of the composite measure standard deviation (.71) to the composite measure standard deviation (1.41). Using this process, the investigator determined that high items were those with a standard deviation of 2.12 and above, moderate items were those with a standard deviation between .71 and 2.11, and low items were those with a standard deviation of .70 and below. Based on this approach, fifteen items were particularly

highly variable in response including "In my class, I probe students' ideas to encourage thinking" with a standard deviation of 2.59 and "I encourage my students to try out what they have learned from me in different situations" with a standard deviation of 2.34. Twenty six items were moderately variable including "I encourage my students to think in different directions even if some of the ideas might not work" with a standard deviation of 1.30 and "I allow students to deviate from what they are told to do" with a standard deviation of 1.32. Four items demonstrated particularly low variability including "I encourage students who experienced failure to find other possible solutions" with a standard deviation of .67 and "I listen to my students' suggestions even if they are not practical or useful" with a standard deviation of .35.

Table 11, in Appendix L, offers an informational frequency distribution of the items in both observations. Data in the N/O column indicates that the item was not observed during either observation. In addition to nominal data, percentage data are also presented in the table.

As previously mentioned, responses to the CFT Index were based on a six-point Likert scale. Values of 1-2 may be considered low, 3-4 may be considered medium, and 5-6 may be considered high on this scale. In Table 11, the majority of items have frequency distributions concentrated in the high (5-6) range, or the behavior was not observed at all by the investigator. This suggests that when the investigator was able to see the behavior, it was being demonstrated at a high level. The investigator therefore established a criterion for determining high or low results in the frequency distribution table based upon items having distributions which seemed to be unusual, or somehow departed from the norm. High results were

determined to be those items having distributions which skewed even more severely than most to the upper end of the response scale, such as "I follow up on my students' suggestions so that they know I take them seriously" and "When my students have questions to ask, I listen to them carefully." Moderate results were determined to be those with distributions most similar to the majority of items, such as "I encourage my students to try out what they have learned from me in different situations" and "I emphasize the importance of mastering the essential knowledge and skills." Low results were determined to be those items which were observed most infrequently, such as "I provide opportunities for my students to share their strong and weak points with the class" and "I encourage students who have frustration to take it as part of the learning process."

Similar to the earlier analysis of the self-report measure, descriptive statistics were also compiled at the subscale and composite measure level for both observations in Table 12. This level of analysis helped the investigator identify entire domains of creativity-fostering behavior which were not directly evidenced during the observations.

Table 12

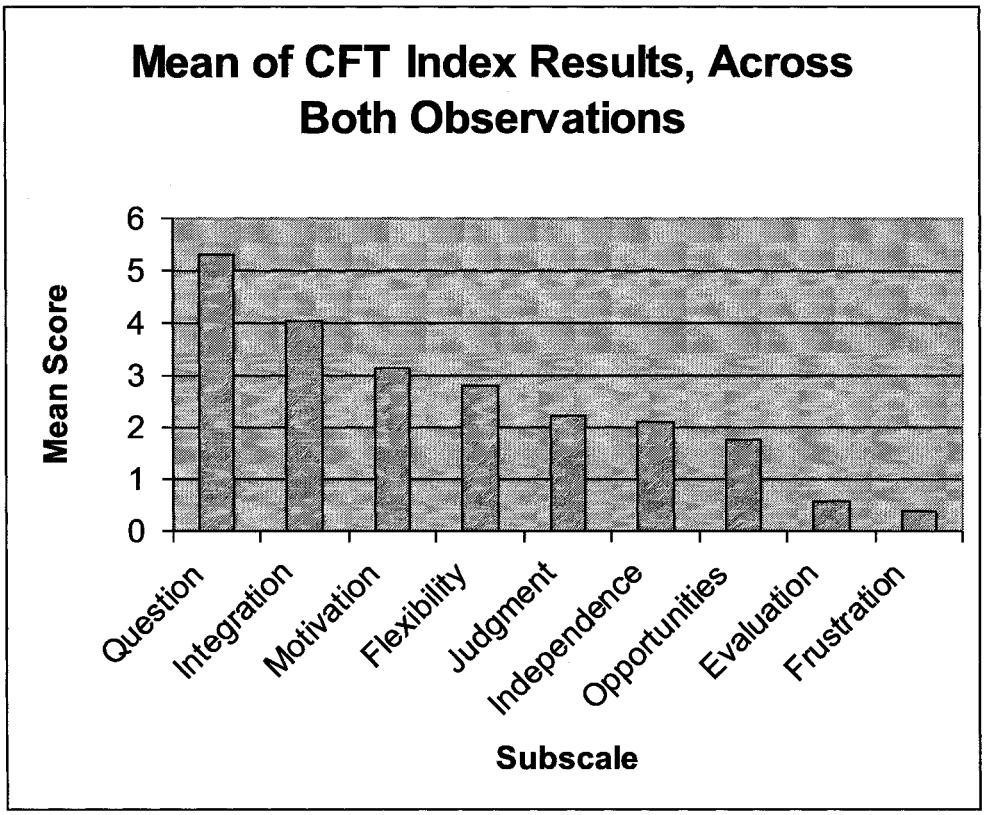
Descriptive Statistics for CFT Index Results, Across Both Observations by Subscale

Scale	*N=9*	*Mean*	*SD*	*Minimum*	*Maximum*
Question		5.31	0.52	4.80	6.00
Integration		4.03	1.01	2.40	5.40
Motivation		3.17	1.68	1.20	5.00
Flexibility		2.79	1.31	0.00	4.80
Judgment		2.22	1.51	0.00	4.00
Independence		2.12	1.30	0.60	3.80
Opportunities		1.78	1.55	0.00	4.20
Evaluation		0.56	0.61	0.00	1.50
Frustration		0.39	0.32	0.00	0.90
Composite Measure		2.54	1.41	0.00	6.00

Figure 2 displays the same information as Table 12, but in bar graph form. It provides descriptive statistics for each subscale in the CFT Index. Mean scores are provided across all 20 participants, and the standard deviation serves as a measure of variability in the data.

Figure 2

Descriptive Statistics for CFT Index, Across Both Observations by Subscale



Using the same criteria as in Table 10 above, high subscales were those with a mean score of 3.95 and above, moderate subscales were those with a mean score between 1.14 and 3.94, and low subscales were those with a mean score of 1.13 and below. The results displayed in Table 14 demonstrate that two of the nine subscales fall in the high range, five subscales in the moderate range, and two subscales in the low range. The results displayed in Table 14 demonstrate that the highest mean score results are concentrated in the Question and Integration subscales while the lowest mean score results are concentrated in the Evaluation and Frustration subscales. The highest variability is evidenced in the Motivation and Opportunities subscales while the lowest variability is evidenced in the Frustration and Question subscales.

Table 13 provides an informational frequency distribution from both observations at the subscale and composite measure level. Once again, scores in the N/O column demonstrate the frequency with which the investigator did not observe items from that subscale in the observations. In addition to nominal data, percentage data were also presented in the table.

Table 13

Frequency Distribution of CFT Index Results, Across Both Observations by Subscale

Item *N=9*	*6*	*5*	*4*	*3*	*2*	*1*	*N/O*
Independence	11 (.24)	5.5 (.12)	.50 (.01)	0 (.00)	0 (.00)	0 (.00)	28 (.62)
Integration	27 (.60)	2 (.04)	2 (.04)	.50 (.01)	0 (.00)	0 (.00)	13.5 (.30)
Motivation	19 (.42)	4.5 (.10)	1 (.02)	.50 (.01)	0 (.00)	.50 (.01)	19.5 (.43)
Judgment	14.5 (.32)	1.5 (.03)	1 (.02)	.50 (.01)	0 (.00)	0 (.00)	27.5 (.61)
Flexibility	17.5 (.39)	3 (.07)	1 (.02)	.50 (.01)	0 (.00)	0 (.00)	23 (.51)
Evaluation	3 (.07)	1 (.02)	.50 (.01)	0 (.00)	0 (.00)	0 (.00)	40.5 (.90)
Question	37.5 (.83)	2 (.04)	1 (.02)	0 (.00)	0 (.00)	0 (.00)	4.5 (.10)
Opportunities	12.5 (.28)	1 (.02)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	31.5 (.70)
Frustration	1 (.02)	1 (.02)	.50 (.01)	1.5 (.03)	0 (.00)	0 (.00)	41 (.91)
Composite Measure	143 (.35)	21.5 (.05)	7.5 (.02)	3.5 (.01)	0 (.00)	.50 (.00)	229 (.57)

As mentioned above, the majority of responses to this scale are concentrated in the mid-high (4) to high (5-6) range. The results displayed in Table 13 demonstrate that the distributions of the Integration and Question subscales appear to skew most heavily to the high end of the Likert scale. Conversely, the distributions of the

Frustration and Evaluation subscales were observed most infrequently and thus represent the lowest results.

Results of Correlations Between Self Report and Observation Data

The correlation matrix in Table 14 displays the relationships between the CFT Index subscales for both the self-report data and the two means of the observations for the nine teachers involved in both aspects of the research study. Significant ($p \leq .05$) positive relationships exist for fourteen variable sets and significant negative relationships exist for seven variable sets. The highest significant positive correlations are those between the Opportunities and Frustration subscales (.943), the Evaluation and Frustration subscales (.842), and the Judgment and Evaluations subscales in the observation data (.823). The highest negative correlations are those between the Independence subscale in the self-report data and the Frustration subscale in the observation data (-.878), the Flexibility and Frustration subscales in the observation data (-.790), and the Flexibility subscale in the self-report data and the Frustration subscale in the observation data (-.773). Non-significant correlations are not discussed. These areas of positive and negative correlation suggest where the investigator's observations and the teachers' perceptions were most strongly consonant and where they were most strongly diverged.

Table 14 Variable Inter-correlations for Self-Report and Observation Data

	1	2	3	4	5	5	7	8	9	10	11	12	13	14	15	16	17
1. Independence subscale SR																	
2. Integration subscale SR	.59																
3. Motivation subscale SR	.43	.23															
4. Judgment subscale SR	.77*	.33	.69*														
5. Flexibility subscale SR	.81**	.37	.62	.74*													
6. Evaluation subscale SR	.50	.47	-.03	.32	.52												
7. Question subscale SR	.31	-.27	.30	.47	.55	.54											
8. Opportunities subscale SR	.69*	.59	.48	.62	.73*	.67*	.28										
9. Frustration subscale SR	.65	.61	.37	.56	.76*	.84**	.39	.94**									
10. Independence subscale Obs	-.44	-.65	-.19	-.29	-.42	-.31	.34	-.70*	-.64								
11. Integration subscale Obs	-.48	-.06	-.48	-.44	-.74*	-.61	-.73*	-.66	-.69*	.25							
12. Motivation subscale Obs	-.13	-.05	-.03	-.30	.17	-.05	.10	-.32	-.12	.33	.07						
13. Judgment subscale Obs	.20	.02	.11	.09	.31	.22	.48	-.12	.04	.56	-.07	.76*					
14. Flexibility subscale Obs	.65	.05	.10	.49	.45	.31	.57	.08	.13	.36	-.20	.17	.67*				
15. Evaluation subscale Obs	.05	.07	.23	.24	.10	.10	.36	-.14	-.01	.57	.17	.49	.82**	.50			
16. Question subscale Obs	-.07	.16	-.58	-.28	-.32	-.18	-.52	-.45	-.35	-.18	.53	.05	-.22	-.06	-.27		
17. Opportunities subscale Obs	.11	.17	.23	.25	-.01	-.01	.24	-.31	-.19	.52	.22	.31	.63	.50	.82**	.07	
18. Frustration subscale Obs	-.88**	-.37	-.13	-.56	-.77*	-.64	-.52	-.49	-.57	.21	.52	-.13	-.43	-.79*	-.12	-.04	-.13

n=55; *p<.05, **p<.01 (1-tailed)

Positive correlations among the CFT Index subscales were not unexpected. Soh (2000) found significant positive correlations between all subscales of the measure ranging from .49 (Independence and Motivation) to .82 (Flexibility and Opportunities) in his initial validation study. Soh's correlations suggest that, while the scales are reasonably independent of one another, they are still measuring something in common. One would expect this from the subscales in a measure. The higher correlations found in this exploratory study, which range from .67 (Evaluation and Opportunities) to .94 (Opportunities and Frustration), may be a statistical artifact of the small sample size used to generate the data.

The negative correlations among the CFT Index subscales were also not unexpected in the context of this study. Some participants reported utilizing behaviors in the self-report data that the investigator was not able to observe in the limited classroom time available. Additionally, from the self-report data, some of the respondents indicated that they utilized behaviors at a high level (5 or 6 response on the Likert scale). The investigator then observed these behaviors being utilized to a lesser extent during the observations. In general, self-report data tends to be somewhat inflated as respondents were predisposed to answer in a socially desirable way, whereas investigators view their behaviors in a more neutral fashion (Arnold & Feldman, 1981).

Teacher Interview Findings

Behaviors of Creativity-Fostering Teachers

Teachers scoring in the 50th percentile on the composite CFT Index measure were asked to further participate in the study by granting the investigator additional

access for two classroom observations, discussed above in the quantitative results section, and an interview, discussed below. Nine of the participants acquiesced. Five English, one history, and three science teachers participated in the interviews. Four interviews were accomplished face to face while five of the participants indicated that they had the time to complete the interview protocol questions individually by creating a typed Microsoft Word document. All interview responses from the participants were transcribed and reviewed by the appropriate participant to authenticate accuracy. Appendix K contains these transcriptions. Frequencies and percentages of similar comments from the participant interviews may be found in Table 15.

Table 15

Sample of Comments from Participant Interviews and Number and Percent of Themed Comments

Theme	Sample Comment from Participant	Number and Percent of Themed Comments
Not normal	"The American public in general, when you are talking about someone who is creative, they see them something other than normal"	6 (67%)
Creativity in students	"A student is very creative when they take an assignment beyond the limits of what I would expect."	5 (56%)
Creative teacher characteristic	"It's not just the students that have to be creative; it's the teacher as well."	5 (56%)
Strategies to foster creativity	"I like giving them little projects, like the books, so they can get creative with things."	7 (78%)
Standardized test hardship	"The SOLs just tie you down. Life is not a multiple choice test. No one is going to ask you, "Hey, do you know where France is?" "What are my options?"	5 (56%)
Facilitates creativity	"If we get in to bring different departments together and get them to have cross talk, things we can do together with joint projects."	5 (56%)
Facilitates creativity	"[One factor is] having a very supportive administration. I went to our principal and said, 'I want to put a geologic timeline on the ceiling.' She said, 'Go for it.'"	5 (56%)

Inductive analysis procedures including open coding (Corbin & Strauss, 1998) and interpretive coding (Patton, 2002) were used to analyze the responses gathered from the nine interviews with the high school teacher participants. The interviewee's answers were analyzed and assigned codes for each theme or thought expressed. Then the investigator gathered relevant themes and corresponding quotes to represent the data (See Table 15). These categories were put into groups to describe types of teacher behaviors to ascertain parallels in the responses.

In the following section, quotations are used to illustrate the interviewees' central ideas to the protocol questions. Each participant was assigned a random number between 0 and 32.

Teacher Perception of Public Definition of Creativity

Some of the teacher responses to the first interview question on creativity were quite similar. Question 1 asked, *How do you think the American public defines creativity?* Five teachers reported that the American public views the concept of creativity as contrary to 'normal.' Teacher 1 responded, "Performing or creating beyond the limits of what is considered normal." Teacher 13 stated, "Anything that's different than the norm..." Teacher 14 stated that, "Creativity is the ability to think outside the norm." Teacher 11 suggested that "The American public in general, when you are talking about someone who is creative, they see them as something other than normal." Teacher 12 stated that "the American public seems to get caught up in manifesting one's creativity by being different."

Question 1 also prompted the teacher responses to be linked together by the term 'arts' or the concept of ideation. Teacher 7 stated, "The American public defines

creativity in different ways; in part through self expression...music, art, theatre." Teacher 18 felt that "The American public defines creativity in the sense of arts and entertainment. When the public thinks of something as 'creative', they are using it as a descriptor for art, literature or music." Teacher 22 reflected that the American public "tend[s] to look at creativity from an art standpoint...the fine arts, music, paintings, that sort of thing." Teacher 22 also felt that the American public defines creativity as "looking for new ideas." Teacher 25 similarly reported that the American public defines creativity as "basically coming up with new ideas and using the imagination."

Personal Definition of Student Creativity

Question 2 asked, *How do you personally define creativity in students as demonstrated in classrooms?* Similar to the first interview question, teachers again mentioned art and, more importantly, the act of creating it. They also reported how students are creative when they make connections and are able to express their ideas. Teacher 18 stated:

> Students can be creative in the traditional sense of physically creating something, or they can be creative in their thinking. I appreciate students who can take a concept and express it in a creative way, in example, putting a concept into art.

Teacher 11 stated:

> A student is very creative when they take an assignment beyond the limits of what I would expect...All I was asking for was a journal entry but here were students going the extra mile to make it look authentic, to look like it really

was. To me that was creativity. Not just handing me a journal entry but trying to make it almost a piece of art work.

Teacher 25 suggested that creativity in the classroom is defined as students:

> Engaging themselves in to what is going on. For instance, I just did a unit on oceanography and my students had to create children's' books on oceanography and they had to use the information that we learned in class correctly...They came up with their own stories and a lot of them were extremely original, awesome stories that literally could be published.

Teacher 7 stated, "I define student creativity as being able to express one's views through various means." Teacher 14 said, "thinking freely and being able to express those thought in discussion is enough...I also appreciate free thought in the form before it is manifested into something tangible."

Teacher 18 reported that creativity in the classroom is "linking a concept to another verbally or in writing, or simply applying an abstract concept to everyday living." Teacher 22 stated:

> Anytime they come up with something that is a link, then they make something that is an intellectual leap between what we are talking about to something in their life or something they've seen or even between just two different subjects...or anything where they show me that they're thinking the next step up.

Creative Teacher Characteristics

Question 3 asked, *What are some individual characteristics of teachers considered to foster creativity?* Teacher's 1, 7, 11, 13, and 14 stated that one teacher

characteristic was being "open-minded" or having "open-mindedness." Many other participants spoke to the classroom environment, creative teachers, and life-long learners.

Teacher 14 suggested that teachers who foster creativity are "Creative themselves" and Teacher 11 agreed by saying, "They have a certain creative side to themselves." Other teachers spoke toward the environment as a characteristic of a creativity-fostering teacher. Teacher 1 stated that a characteristic is "creating a creative environment" and Teacher 25 stated that "making an environment that allows creativity as well." Teacher 14 selected the character adjectives "nurturing, accepting" that one could argue creates a classroom environment. Teacher 22 stated that creativity-fostering characteristics are owned by "teachers that can be animated and draw the kid's attention in some way...even those of us that aren't as theatrical, if we can just praise the kids even for coming up with some sort of 'off-the-wall' thing."

Teacher 18 suggested that "Creative teachers are those who are interested in their colleagues' techniques and routinely collect new information to improve their own theories and methods." Teacher 13 felt that a characteristic was also "going to conferences and trying to discover new ways to do things I wish I knew more about it. Often, you get these educational magazines that you can recycle. There are, sometimes, good things in there." This teacher also felt that "Asking another teacher, reaching out" was an individual characteristic of teachers who fostered creativity.

Finally, Teachers 1 and 7 felt that teachers who fostered creativity were, in general, "enthusiastic" and demonstrated how they had "energy."

Student Creativity-Fostering Strategies

Question 4 asked, *What strategies do you use to foster student creativity? Why?* Many of the teachers spoke of structured discussion strategies and tangible, hands-on projects as strategies used to foster creativity. Teacher 14 answered:

> [In] Socratic Seminars...students are encouraged to express any idea as long as they can support what they say with some kind of evidence. I also use journaling...students respond to visual art (paintings and film) in addition to written texts because it allows them to see that analysis of 'art' is the same as analysis of 'literature'.

Teacher 13 stated:

> The kids asked if they could go home and use the computer, and I said I want you to be creative in the classroom. [I]t asks the question, 'Are you really thinking when you're downloading a picture?' But when you draw something I think it comes across better. I think that when you write something on a paper or draw something it sinks in better than if you print something off and hand it in.

Teacher 22 suggests:

> In Earth Science, I've started having them do illustrations of what we are doing in class, and showing their view of what we are in to. Lately I've had an entire assignment in class, instead of having them write out all these little facts about the atmosphere, I've had them do an illustration of pulling all they knew about the atmosphere in to a drawing with the facts worked in to it.

Many teachers, like Teacher 1, discussed they used "hands-on learning, i.e. model making" as creativity-fostering strategies. Teacher 25 stated:

> I have an Earth Science II class where they got to design earthquake resistant homes and they could do their own designs as long as they followed a certain criteria. That allowed them to do some pretty interesting things. Some of them really worked. It was really cool…just having the discussions, questioning them instead of giving answers, having labs and projects that allow them to shine in different areas.

Teacher 25 also stated:

> With the oceanography books that we did, I had two students ask me if they could do a sing-along book instead of the colored picture book. I said, 'That's great! Totally do that, but you have to turn in the colored book, too.' They turned it in, brought in guitars, and made a whole song to Johnny Cash's *Ring of Fire.*

Teacher 22 reported: "I'll have them do presentations where the kids go in and they pull out what they think is interesting and they present that to the rest of the class." Teacher 13 said:

> I had the students watch a documentary and then try to write an essay about how the director was viewing it….I let them do sock puppets one year and it was great for absolutism, but it just took forever. It was great; the kids were really creative about it…I did the rap songs last year…we did a brochure for Islam, you know, something creative like that, advertising Islam, saying what it's about.

Teacher 18 said that, to foster creativity in the classroom, she will "often engage my students in book talks and have them create a physical representation of the book read. They enjoy the opportunity and tend to read more because of it."

Learning and Creativity Relationship

Interview Question 5 asked, *What is the relationship between creativity and learning in the classroom?* Initial teacher comments suggest that education and creativity have a strong relationship with each other. Some of the comments were, "to learn, you have to have creativity", "Creativity drives learning", "One is synonymous with the other", and "They are part and parcel of the same thing."

Teacher 13 suggested that, "There are different means by which [students] can get things, but I have to be creative. They have to be creative, too, and as open-minded...just like I am." Teacher 18 agrees. She stated: "I have had to...fit creative learning and expression into a smaller time slot. Teachers can still be creative within a time limit." Teacher 7 states: "There must be a high level of creativity, inventiveness, and flexibility on the teacher's part in order to reach the students." Finally, Teacher 25 stated:

> It's not just the students that have to be creative; it's the teacher as well. If you're not, well, it's 'Here's another class.' It's not fun for anybody, for that matter. Teachers have to be creative. You never know what's going to happen in the classroom. You have to be flexible or creative and come up with something on the trend.

Enhancing Creativity in Schools

Question 6 asked, *What do you believe American school systems can do to enhance the fostering of creativity?* Over half of the participants spoke of the hardships associated with standardized testing. Teacher 18 replied: "This particular question is difficult due to national and state standards. Individual systems are governed by them and therefore must meet them. To foster creativity, teachers must be encouraged, rather than barraged by statistics, data and test scores." Teacher 1 stated: "Teachers are on such a schedule to present all the information necessary for students to pass the Virginia SOL. Sometimes outside interests are not afforded the time because of the schedule." Teacher 7 suggested:

> One thing that could be done is to minimize the focus on standardizing everything about education. Students don't come to the schools standardized, and while there are some skills that all students must know, the way those skills are presented and how their mastery is evaluated does not have to be the same across the board. A student who [achieves] should be praised and evaluated according to his/her achievements and capabilities, not demoralized and constrained by being compared to everyone whose capabilities are vastly different from his/her own.

When asked about what American schools can do to enhance the fostering of creativity, some teachers reported that they would suggest eliminating standardized tests such as Virginia's SOLs. Teacher 13 reported:

> Get rid of SOLs. The SOLs just tie you down. Life is not a multiple choice test. No one is going to ask you, 'Hey, do you know where France is?' 'What

are my options?' It's just something that you need to know. It's mind-boggling and it makes you think when you don't have the multiple choices there. I think writing SOLs are fine, but it's too constrictive. There are too many things on the SOL that shouldn't be there. It's not going to impact their lives. They don't go hand-in-hand.

Teacher 25 stated:

Honestly? Get rid of the SOLs. I think the idea behind the SOL is really important. The student should have certain things that they need to know but it takes away from a lot of the things the teachers would like to do. To really make sure that the students understand and know and are really engaged in the unit I know that for those of us who teach science find it difficult because we feel that we are just pounding the information in to the students and it leaves little time for the creative aspect. We don't have time to do as many labs as I would like to do because we have to move on because we have to get this much information in by May. It's very hard. Teachers have to be creative to figure out how we are going to get this lab and this information in and move on. It's hard. In discussions, there are times when I want to keep going with discussions because the students are really engaged and are really interested, but I say, 'Guys, we really have to move on.' It's hard because it is really cutting off their creativity. Cutting off what they want to talk about and want to learn. We have tests that we have to take at the end of the year. There are times when I say 'Okay, we can't be creative part because you just need the information.' That's just straight memorization. That's not good because they

> can't apply it later on. Creativity allows them to apply what they've learned. SOLs are definitely one of the biggest things that we need to get rid of...Either that or just move it back to later in the year, because the idea and theory behind it is really good.

Fostering Creativity in Students

Interview Question 7 asked, *Why do you believe that creativity should be fostered in K-12 students?* Some teachers mentioned how the American society nearly demands creativity from its citizens. Teacher 13 stated that "America is very creative in business practices and that's been our strength". Teacher 7 reflected:

> Creativity should be fostered in K-12 students because; the way that our society is now demands it. There are so many new fields opening up, especially in regard to technology, that today's student needs to be capable and to stand out among all the other people who can perform the status quo without stretching beyond it.

Two of the participants mentioned the idea of the students' 'life' and how it is intertwined with creativity. Teacher 18 stated: "Creativity is a key to development. Creative people tend to be the most successful in life, and our job is to make them the very best that they can be." Teacher 11 reported, "Our students will realize what they want out of life and if creativity isn't put down, or isn't stigmatized, we will have a happier school population."

Teacher Experience and Creativity

Question 8 asked, *What is the relationship between your past experiences and creativity?* A few of the respondents mentioned the negative interactions they had with teachers during their formal education. Teacher 11 replied:

> I was squelched...not that I'm not creative. I guess in elementary school, of course this was many years ago, only the best were pushed on. If you weren't the best no provisions were made for you. And I wasn't the best. Only the 'A' students got to do the bulletin boards, and I wasn't an 'A' student. Only the 'A' students were chosen for committees, had their drawings put up, or knew enough about music to be encouraged to take music. So, I was squelched.

Teacher 7 had a similar experience: "To some degree, my levels of creativity are borne of obstinacy. I had many teachers who encouraged my creativity, but they didn't impact me as strongly as those teachers who tried to suppress it." Finally, Teacher 14 stated:

> I floundered in Math and Science because very little creativity was involved in those subjects. It was not until I had a teacher who seemed to value what I had to say that I even became interested in my English classes. It was actually that teacher, who welcomed creative thinking, who inspired me to be an English teacher.

When asked to respond to their past experiences and creativity, two teachers reported that at one time they needed to realign their views of creativity. Teacher 13 said:

> Reality sets in. I had a lot of education classes and its like 'Yeah, this is great!', then you get in the classroom, and you're like, 'This doesn't work'. It takes a few years to figure out what works and what doesn't...During the first few years, you want to try to get to the content, you try something out and that doesn't work, but now maybe that something may work. You can probably go back and implement those simple things in the classroom since you have that foundation that you need right now.

Teacher 18 stated:

> I have had to reevaluate creativity and its place in the classroom. My creative assignments have been altered to fit the pace of my classroom and state standards. Please note that the term 'altered' was used rather than eliminated. It is still acceptable and expected to be creative in the classroom. I feel that I am actually more creative in my classroom and encourage more creativity from my students with the standards in place. Because of strict guidelines I have to use all of my creative resources to design lessons that allow the fastest route to comprehension of the lesson.

Creativity-Fostering Abilities

Question 9 asked, *What factors facilitate your ability to foster creativity? In your classroom? In your school?* Many teachers mentioned their colleagues and administration when answering this question. Teacher 22 reported: "The staff is really good here. I wish, if I had another planning period, I'd be hunting more people down...If you can actually...get together with some folks they are more than happy to help you to bring ideas together." Teacher 7 stated that "several resources to help

foster student creativity in the school…include…other teachers teaching the same or a relative subject. Drawing from other people's experiences always allows for one's mind to expand, whether one is 14 or 44." Teacher 18 said:

> As a school we are encouraged to work with other teachers outside of our individual departments. By doing this we can be more creative because we know that concepts are being reinforced in others' classrooms. By working together we develop creative activities together and combine the time.

Teacher 13 said that "Talking to other teachers, breaking down the walls per se, and try to reach across, within the school, and hopefully, next year, with working across the curriculum, trying to see how to incorporate science more in to the classroom." Teacher 25 added:

> Having co-workers that you can bounce things off of is really awesome. 'What about this?' and they say, 'Yeah, that's really cool, but what if you change it to this?'…It's one of the things I really like about this school. We have such a supportive staff that is very creative that we can bounce off a lot of ideas.

Many teachers mentioned their building administration when asked about factors that facilitate creativity. Teacher 12 stated:

> I appreciate the latitude that I am given in my classroom and in the school. I have opportunities to create my own curriculum while incorporating texts that my Math/Sci[ence] students need to have in common with the comprehensive students by their senior year.

Teacher 1 said: "I am able to foster creativity when I have the supplies, equipment, permission and support to perform at times 'outside of the box.'" Teacher 11 stated:

> [My principal] allowed me to be as creative as I can be in this [reading] program...she allows me so much leeway that I think that pretty much if they ever decided to be creative it could happen because she's not so driven...she's the reason I can do what I do with these kids.

Teacher 13 stated: "The principal, to give funding, making us aware of what's out there, having people come in for in-service. I go back to the stuff I have in in-service and pull it out to see if it will work."

Finally, Teacher 25 stated:

> [One factor is] having a very supportive administration. I went to our principal and said, 'I want to put a geologic timeline on the ceiling.' She said, 'Go for it.' That was something that was different. The [students] had to figure out all the conversions, measure the hallway, and figure everything out. I feel that if I didn't have the support of the administration that would have never happened, and that is something that is pretty cool because that is something that we can share with the entire school.

Overall Findings by Research Question

Findings for Research Question One

Research Question One asked, *"To what degree do 9th and 10th grade teachers report the use of creativity-fostering behaviors in the classroom based on Soh's CFT Index?"* This question was designed to ascertain the level of behaviors

that teachers report they exhibit in their classroom. The data that responded to this question were from Soh's (2000) CFT Index self-report survey. The participant self-report scores were analyzed quantitatively with descriptive statistics (see Tables 6 and 8).

Participants in the study report the use of the creativity fostering behaviors to a moderate degree. Of the 45 behaviors, 39 fall within the moderate mean score range. Only two behaviors have mean scores which suggest they are used to a high degree while, similarly, only four behaviors have a mean score suggesting they are used to a low degree. Variability across the items also suggests that the consistency with which the behaviors are used varies to a moderate degree. Twenty-seven behaviors fall within the moderate standard deviation score range. Eighteen behaviors have standard deviation scores which suggest a high level of variability, or disagreement among teachers regarding the use of these behaviors. No items evidence a standard deviation score in the low range, which suggests that no single items were uniformly agreed upon by all teachers as a creativity-fostering behavior that they implement in the classroom.

Findings for Research Question Two

Research Question Two asked, *"What strategies for fostering creativity are implemented by teachers who score in the top 50th percentile of the CFT Index measure?"* This question was designed to describe the behaviors that creativity-fostering teachers incorporate in their classrooms. Data were collected from two one hour-long observations using the CFT Index Observation Scale.

The investigator observed ten behavior strategies which fell within the high mean score range, indicating that these behaviors were demonstrated with a high level of effectiveness in the classroom. Additionally, four items were identified as having low variability, indicating that these behaviors were demonstrated with a high level of consistency. Two of these items were not observed. Table 16 shows the means, standard deviations, minimums and maximums for the highest rated behavior items from both observations. These data provide information regarding central tendency, variability, and range for these behavior items.

Table 16

Descriptive Statistics for CFT Index Responses, Highest Rated Behavior Items Across Both Observations

Item *N=9*	*Mean*	*SD*	*Minimum*	*Maximum*
16. When my students have questions to ask, I listen to them carefully.	6.00 (H)	0.00	6.00	6.00
34. I listen to my students' suggestions even if they are not practical or useful.	5.83 (H)	0.35	5.00	6.00
7. I follow up on my students' suggestions so that they know I take them seriously.	5.67 (H)	1.00	3.00	6.00
25. My students know that I do not dismiss their suggestions lightly.	5.22 (H)	1.28	3.00	6.00
2. In my class, students have opportunities to share ideas and views.	5.17 (H)	1.32	3.00	6.00
14. I encourage my students to ask questions freely even if they appear irrelevant.	4.67 (H)	2.00	0.00	6.00
29. I encourage students to ask questions and make suggestions in my class.	4.67 (H)	2.18	0.00	6.00
21. My students know that I expect them to learn the basic knowledge and skills well.	4.61 (H)	2.15	0.00	6.00
5. In my class, I probe students' ideas to encourage thinking.	4.22 (H)	2.59	0.00	6.00
1. I encourage students to show me what they have learned on their own.	4.17 (H)	1.54	2.50	6.00

Table 17 shows the means, standard deviations, minimums, maximums and composite measure for the highest rated behavior subscales from both observations. These data demonstrate that, when grouped together by subscale, items involving Question, Integration, and Motivation behaviors were demonstrated with the highest levels of effectiveness in the classroom. This seems true despite the variability among these subscales' mean scores given that all their means are above that of the composite measure.

Table 17

Descriptive Statistics for CFT Index Results, Highest Rated Subscales Across Both Observations

Subscale	*N=9*	*Mean*	*SD*	*Minimum*	*Maximum*
Question		5.31	0.52	4.80	6.00
Integration		4.03	1.01	2.40	5.40
Motivation		3.17	1.68	1.20	5.00
Composite Measure		2.54	1.41	.67	4.51

Furthermore, the observations were well aligned with participant self-report data for the Integration and Question subscales. The mean score for the self-report data for the Integration subscale was 5.08 and the mean of the Observation scores was 4.03. Similarly, the mean scores for the self-report data for the Question subscale was 5.06 and the mean score of the Observation subscale scores was 5.31. Interestingly, more Question behaviors were actually observed in the classroom than were self-reported by the teachers on the CFT Index self-report survey.

A lack of alignment between self-report data and observations was evidenced in Evaluation and Frustration. The mean score for the self-report data for the

Evaluation subscale was 4.08 and the mean of the Observation scores was .55. Similarly, the mean score for the self-report data for the Frustration subscale was 4.87 and the mean of the Observation scores was .39.

The observations also revealed that the teachers participating in the study shared classroom strategies implemented to foster creativity. During the observations, most teachers implemented some type of project at various stages. The participants also tried to facilitate an environment conducive to creativity by allowing students to express their ideas and by giving students open-ended directions. These teachers also gave their students varying levels of choices, and were observed to be creative themselves by creating lesson plans and implementing teaching concepts. The participants tried to reward creativity when it was displayed by a students' thinking or project creation.

Findings for Research Question Three

Research Question Three asked, *"What are the factors that impede or facilitate creativity-fostering behaviors in the teachers who score in the top 50th percentile of the CFT Index measure?"* The question was designed to examine the aspects of the teachers' environment that enhanced or dampened their ability to foster creativity in the classroom. Data analyzed to answer this research question were gathered from Part III (Table 2) of the teacher-participant interview protocol. These four open-ended questions (Questions 6 – 9) revealed emergent themes for fostering creativity in the classroom. The participants identified several major facilitators of creativity. They reported that their principal encouraged classroom creativity by allowing teachers to complete projects and carry out activities not necessarily

outlined by the Virginia Standards of Learning. Colleagues were also mentioned by many of the participants. It was reported that fellow teachers encouraged, became a sounding board, or allowed other teachers to borrow materials used to allow creativity in the classroom. Rounding out the top three facilitators was the general feeling, or climate, of flexibility that promoted creativity in the high school. The participants identified the major obstacles to creativity as the mandated Virginia Standards of Learning (SOL) standardized tests, a lack of time to brainstorm or plan with colleagues, and completing administration-assigned teacher duties.

Conclusion

In this chapter, the investigator presented the analysis of the data from the CFT Index self-report survey, the interviews, and the classroom observations collected during the study. In the next chapter, the investigator will present a summary of the study and a discussion of the findings. The investigator will also offer conclusions and implications for practice, policy and further research.

Chapter 5: Discussion, Conclusion, and Implications

Summary of the Study

In recent years, standardized testing has received an increasing amount of attention. The focus on 'teaching to the test' may leave little time in classroom schedules for teachers to teach the curriculum through creative activities. Based on this apparent change in educational practices, the purpose of this exploratory study was to examine creativity-fostering, secondary teachers' instructional strategies and behaviors in the high-stakes standardized testing environment, emphasized by the recent No Child Left Behind Act of 2001 (NCLB).

Educational research on standardized testing has tended to focus on the elementary grades (Firestone, 2001; Jones & Johnson, 2002) with a paucity of empirical research focusing on secondary classrooms. Piirto (1995) linked creativity and the classroom when she defined creativity as "the personality, the process, and the product within a domain in interaction...with optimal environmental influences of...school" (p. 392). Soh (2000) suggests "there is a need to study teachers' creativity fostering behavior...to complement research on student creativity for a more complete understanding of the effect of teaching behavior on the development of creativity" (p. 130). This study was also designed to examine the factors that impede or facilitate teachers' creativity-fostering behaviors. Also explored was the degree to which 9th and 10th grade teachers report the use of creativity-fostering behaviors in their classrooms.

This study was completed using data from twenty CFT Index self-report surveys. Nine interviews and eighteen classroom observations of teachers who rated themselves as highly creative in the classroom also provided data. Through the CFT Index self-report survey, teacher participants were asked to assign a rating to creativity-fostering behavior statements. Participant self-reported survey data were analyzed quantitatively using descriptive statistics.

The teacher interview protocol asked participants to define creativity and the characteristics of teachers considered to foster creativity in the classroom. Participants were asked to delineate strategies that they used to foster student creativity, to comment on the relationship between creativity and learning in the classroom, and why they believe that creativity should be fostered in K-12 students. Participants were asked to list the factors that facilitate their ability to foster creativity both in their classroom and in their school. They were also asked to give their opinion on how they believed the American public defines creativity. Participants were also asked to divulge the relationship between their past experiences and creativity, and what they believe American school systems can do to enhance the fostering of creativity. The interview data were analyzed using inductive and interpretive coding and thematic content analysis (Rossman & Rallis, 1998; Patton, 2002; Creswell, 2007).

Finally, each of the nine participants agreed to two observations that allowed the investigator to rate him or her in the classroom setting with the CFT Index Observation Scale. Both hour-long observations transpired in early December 2007 and late February 2008.

Discussion of the Findings

A goal of this study was not to judge participants' levels of creativity, but rather to determine the degree to which creative behaviors are evident in teachers that score well on a specific creativity-fostering behavior survey. Evaluating levels of creativity requires additional data sources centered on student learners and institutional frameworks of the participants. Therefore, the purpose of this study was to gain insights into teacher's creative behaviors during the current high stakes testing context. Drawing attention to original conceptualizations of creativity (Galton, 1892; Guilford, 1950), and to the theoretical understanding that creativity was an aspect of seven intelligences and thinking patterns that were necessary for learning in the classroom (Gardner, 1983), the investigator proposed a study to examine Cropley's (1997) list of teacher behaviors that foster creativity. The study was also created to examine the degree to which these specific behaviors were evident in the current high stakes standardized testing context of a public high school, a study that lacks precedence. Therefore, the investigator attempted to examine the degree to which creativity-fostering behaviors were reported and the extent to which they were observed in the classroom. The investigator also endeavored to relate the findings to issues of differentiated instruction. These goals provide the framework for a discussion of the findings.

Creativity-Fostering Behaviors

Researchers in the field of education have described teacher behaviors that foster creativity in the classroom (Angleoska-Galevska, 1996; Perkins, 1999; Renzulli, 1980; Sternberg, 2003; Sternberg & Lubart, 1991). Many researchers have

also written on the diversity of the act of teaching and fostering creativity, as well as the intricate artistry required in teaching (Amabile, 1988; Cropley, 2001; Dadds, 1993, 1995; Halliwell, 1993; Isaksen, 1995; Tomlinson, 1995; Woods & Jeffrey, 1996). The greater part of these research studies and reviews on creativity-fostering teachers have not examined the instructional strategies and behaviors of creativity-fostering, secondary teachers nor have they focused on the creativity inherent in the learning of 9th and 10th grade students in the high-stakes standardized testing environment, emphasized by the recent No Child Left Behind Act of 2001 (NCLB). This study supported many of the strategies and behaviors of creativity-fostering teachers noted in the general and gifted education literature.

Participants in this study reported the use of creativity-fostering behaviors in the classroom to a moderate degree. This suggests that while teachers are engaging in some creativity-fostering behaviors, such as "When my students put what they've learnt into different uses, I appreciate them", "When my students have questions to ask, I listen to them carefully", and "In my class, students have opportunities to share ideas and views", these behaviors may not represent a primary instructional strategy and the idea of fostering creativity may not be of paramount importance to these educators. Perhaps the educators are engaging in another type of pedagogy. This may be a result of the current focus on standardized testing in many classrooms. Additionally, a moderate level of variability exists across the behaviors utilized, suggesting that teachers in this study may have very different approaches to fostering creativity in their classrooms. The investigator observed teachers that relied on open-ended answers during discussion as a main avenue towards fostering creativity. Other

teachers were observed using the strategy of project and presentation to foster creativity in their classrooms. While this diversity of behaviors may offer students with different learning styles the opportunity to perform creatively, it may also be evidence of a lack of agreement and general understanding of how best to approach the fostering of creativity.

In addition, the investigator identified ten creativity-fostering behavior strategies that were demonstrated during the observations with a high level of effectiveness. The top four behaviors all came from the Question subscale of the CFT Index, suggesting that teachers working to foster creativity are particularly focused on taking students suggestions and questions seriously (Cropley, 1997). This may provide a good foundation for creativity in the classroom, but by itself is likely to be insufficient when fostering classroom creativity long-term.

Teacher Qualities and Competencies that Foster Creativity

The nine subscales from Soh's CFT Index aligned with Cropley's (1997) behavioral characteristics of creativity-fostering teachers. Teacher competence in these domains should encourage creativity in the classroom. In the self-report data, the participants claimed moderate levels of competence in all of the domains except Evaluation, in which they claimed only a low level of competence. This suggests that teachers may benefit from staff development programs aimed toward increasing awareness of specific characteristics of creativity-fostering pedagogy. These classes may include open-ended questioning techniques, problem focusing, problem solving, problem definition, and freedom with focus.

In addition, some domains of creativity-fostering behavior were evidenced very rarely during the classroom observations. These include the Opportunities, Evaluation, and Frustration domains. One explanation for this outcome could be that the limited time the investigator spent in the classroom was insufficient to see evidence of these behaviors. An alternative explanation is that teachers may not understand the usefulness of these behaviors for fostering creativity in the classroom. Again, staff development programs aimed toward these characteristics may increase their use in the classroom.

Through open-ended interview questions, the participants in the study defined individual characteristics of teachers considered to foster creativity. Many mentioned how creative teachers have characteristics such as "open-mindedness" (Sternberg, 2003), have the attitude of a life-long learner (Sternberg & Lubart, 1991) and engage in reflection to improve their own teaching methods (Van Manen, 1977). Some participants suggested that the creative teacher should have creativity abilities themselves (Lewis, 1982), as well as create creativity-conducive classroom environments (Amabile, 1988; Raina & Vats, 1979).

However, a majority of time in the interviews was spent discussing the idea of external environment and its important role in the creativity-fostering teachers' character. Studies in creative environments have also suspected that the role of the environment is critical in encouraging creative behavior (Amabile, 1988). The external environment is produced by influential people, places, or climates that impact the motivation of an individual to pursue a specific career. In this study, the career is that of a high school core subject teacher. Schutz, Crowder, and White

(2001) suggest that influences from teachers, family, and peers are of prime importance to pre-service teachers. Some participants spoke to the impact of their external environment in the form of teachers, family members, and climates. Teacher 14 reported that she did not become interested in school until a teacher valued what she discussed in classroom discussions. She stated that this teacher inspired her to become a teacher. A particularly strong memory was recalled during an interview with Teacher 11. She recalled on a fifty-one year old memory in which a teacher first 'reached out to' and believed in her.

Although a discussion of external environment was not posited as part of the original study, the participants were so focused on its relationship with creativity-fostering that expansion of the topic seems warranted.

Situation and Climate as External Environment

External environment as a theme also encompasses situations and climates that shaped our participants' desire to become educators both in positive and negative ways. Tannenbaum (1986) contends that "there are no universal characteristics under which all talents flourish" (p 397), but that "excellence thrives best in an atmosphere of love and encouragement." He places just as much importance on environments which create adversity or pressure, maintaining that such environments serve to stimulate individuals to fulfill their potential (Tannenbaum, 1986). The participants' reactions to their environments support Tannenbaum's claims. Significant places, according to the participants, include community settings, school, and home. Teacher 22 reported that she appreciated her parents asking her to search for the definition and

meaning of a word of the day. She reported that this exercise from her youth allowed her to view concepts differently.

School settings played an important role in influencing some of the participants' future careers as educators and in developing their ideas and values with respect to creativity. Teacher 7 said that she became more passionate about creativity when it was suppressed by her teachers. She stated that these teachers help crystallize the importance of creativity in her life more than the teachers who fostered it.

Based on these interviews, the importance of environmental factors in developing teacher qualities and competencies that foster creativity cannot be overstated. Previous positive or negative experiences with role models such as teachers or parents seem particularly germane in forming life-long views on the importance of fostering creativity. This suggests that teachers who have not experienced creativity for themselves as learners may be unable to foster it in others.

Factors Which Impede or Facilitate Creativity-Fostering Behavior

The interviews further revealed that the teachers participating in the study have relatively similar perspectives as to what helps or hinders their creativity-fostering behaviors in the school and classroom.

Five of the nine teachers interviewed (56%) indicated that administration positively influenced their ability to be creative in the classroom. The principal was praised for being "open," for making teachers aware of professional opportunities, and planning meaningful staff development. Administration was also identified as a factor that supported creativity by establishing collaborative environments for the teachers' creativity.

The need for collaboration with their colleagues was expressed by five of the nine teachers interviewed (56%) to support their creative abilities. "Having co-workers that you can bounce things off of" and providing support to assist each other through challenges were typical descriptions of informal collaboration with the participants' colleagues. Also described was the alignment of core subjects within the high school. The intention is to promote more science in history or more English in math to encourage creativity. This is consistent with the research which suggests that collaboration is an important condition for creativity and growth (Fullan, 2001; Hargreaves, 2003; Kanter, 1983; Osterman & Kottkamp, 2004; Sternberg & Lubart, 1995).

Other teachers were also designated as facilitators of creativity-fostering behaviors. The willingness of colleagues to share their experience, know-how, and tangible materials played an important part in the participants' creative abilities.

The concept of 'time' was indicated to be a deterrent to fostering creativity. This obstacle is consistent in the literature (Fryer, 1996; Hargreaves, 2003; Osterman & Kottkamp, 2004). Making copies, a lack of conference time with colleagues, and requiring teachers to "sit and sign people in at the front door all day long" were also mentioned as culprits of wasting time and impeding creativity-fostering behaviors. Another participant stated that she was required to teach from a reading program that was, "like a basal reader. They tell you when to sit down, when to stand up and when to spit."

More than half of the participants, 56% (N=5), spoke against high-stakes standardized testing and restrictive policies, particularly the state of Virginia's

required Standards of Learning (SOLs). These responses are often repeated in the literature (Haney, 2000; McNeil & Valenzuela, 2001; Smith & Rottenberg, 1991; Jones, Jones, & Hargrove, 2003; Fusarelli, 2004). Leistyna, Lavendez, & Nelson (2004) referred to the NCLB legislation as a "callous, mean-spirited, profit-centered and now entrenched federal mandate" (p. 14) that is pretending to have the qualities of fairness, compassion, and equity. Hargreaves's (2003) research found that the NCLB type of standardization is causing an 'educational apartheid' by training students to assume various positions in the economy. He advises that more opportunities and flexibility are needed to engage learners in decisive and innovative capacities rather than simply promoting basic, standard knowledge. Delpit (1995) agrees with this view, reinforcing that a simple basic skills approach should not be prescribed for diverse children who are outside "the culture of power. It would be (and has been) tragic to operate as if these children were incapable of critical and higher order thinking" (p. 30).

Standardized testing was seen as a hurdle for facilitating creativity-fostering behaviors. These tests restricted the participants' creativity-fostering ability to develop what they believe to be appropriate curriculum. Although a couple of the participants mentioned that high stakes testing accountability actually increased their creativity in the classroom, for more than half of the teachers, mandated testing appeared to lead to frustration and, ultimately, burnout. Many of these participants questioned the rationale behind the testing, as well as the time of the year and the relationship between the tests themselves and students' future out of the classroom. The majority of the teachers were opposed to the time that testing strips away from

other important areas of teaching and learning. They described how standardized testing has worked to accelerate the speed of the curriculum without deepening the learning of the curriculum. Teachers were also concerned about the fairness of the test as it pertained to students who are not moving on to college after high school, but rather intend to pursue a full-time position in the workforce. Emotions ranged from the 20+ year experienced teacher stating, "Thank goodness I don't have an SOL this year with these kids" to the 5th year teacher explaining that "There are times when I say 'Okay, we can't be creative [on this] part because you just need the information.'"

Although not the focus of this study, there was also a minor tendency for the participants to include students as the reason for lack of their creativity-fostering behaviors. Interview participants mentioned how students cannot learn through their auditory or visual senses, or if learning occurs, it is lost through the watching of DVDs or listening to CDs. Some participants mentioned the lack of student ability to just "sit still" and learn the materials without constant reminders to stay on task. Another participant reminded her students, when taking a standardized test, to "not be creative here because this is not what they are looking for, they are looking for whether or not you understand the basics."

In contrast, teacher participants who scored higher on the CFT Index discussed the idea of hands-on projects (Shallcross, 1981; Sternberg & Lubart, 1991) and student choice (de Souza Fleith, 2000; Greenberg, 1992) that supplemented the curriculum. All of these strategies were found in the literature to be creativity-producing activities. Rather than seeing the student as a hindrance, these teachers saw

beyond the aforementioned barriers. They attempted to use creativity-fostering behaviors to overcome challenges to allow their students to learn.

Based on these interview data, the support of administration and teaching `peers may be essential for creativity-fostering behavior to occur in the classroom. Administrators who are ignorant of the relationship between creativity and learning or who do not offer enriching staff professional development opportunities to their teachers may be faced with entire teacher populations who neglect creativity in their classrooms. Additionally, a lack of time, often cited in the literature, (Amabile, 1988; Edwards & Springate, 1995; Shallcross, 1981) and the perceived impact of standardized testing seem to be primary roadblocks impeding the use of creativity-fostering behaviors. To overcome these obstacles, it appears likely that teachers need support from both administration and their peers.

Differentiated Instruction

A common definition of the framework of differentiation is allowing for in-depth learning of a self-selected topic, developing productive, higher level thinking skills, encouraging the development of products that challenge existing ideas and producing 'new' ideas (Kaplan, 1979). Research on differentiation suggests that the idea is relatively unknown among educators (Tomlinson, Tomchin et al., 1994; Tomlinson, Moon, & Callahan, 1997; Worley, 2006) and that implementation among educators is lacking (Archambault et al., 1993) or improperly employed (Diezmann & Watters, 2002). However, some research results suggest that several models of differentiation work within classrooms, including content-based curriculum, student

choice, and differentiated instructional strategies (Friedman & Lee, 1996; Ehlers & Montgomery, 1999; VanTassel-Baska, 2002).

In prior research, occurrences of differentiation have been found infrequently. Even when differentiation is found in a classroom setting, it is often being used inappropriately. The results of this study were therefore somewhat unexpected. Many of the teachers' self-report questionnaires, analyzed concurrently with the investigator's multiple classroom observations, suggest that differentiation is occurring to some degree in the classrooms of those teachers who received high scores on Soh's (2000) CFT Index.

Even though the term 'differentiation' was not included in the CFT Index, within teacher participant interview questions, or in participant responses, many of the participants referred to using strategies that reside within the realm of Kaplan's (1979) definition of a differentiation framework. As an example, Teacher 13 was observed giving students a section of the class period to create student-chosen historical symbols or people out of clay. As a project, the students were going to take digital pictures of their historical creations in a series of different poses. These pictures were to be filmed and the final project, from independent learning, would involve the clay creations appearing to move as animation to describe or reflect on significant historical events or ideas. The project involved clay and animation and was called Claymation. The somewhat unexpected findings regarding differentiation may be a result of the project-focused strategies that so many of the teachers employed as well as the willingness of their administration to permit the teachers to work outside of the standardized testing defined parameters. In this classroom, the

investigator observed group investigations, products, independent study, and supplementary materials. These instructional and management strategies differentiated the content, process, and product (Tomlinson, 1999).

Conclusion

The findings from the self-report survey and observation phases of the study suggest that the demonstration of a broad range of creativity-fostering behaviors as facilitated in 9th and 10th grade classrooms in this sample of nine public high school teachers. Further, creative abilities appeared to facilitate the interview participants' interaction with, and influence upon the students along with the demands of standardized testing. The creativity-fostering behavior dimensions of Integration and Frustration were found to be important motivators in initiating and sustaining participants' reflective efforts associated with creativity in their classrooms.

Based on the findings from the interview phase of the study, it also appeared that the broad range of creativity-fostering behaviors suggests that the surrounding environment to the students' developmental process greatly affects outcomes within creative domains (Gagné, 1995). Within this category of analysis, administration, colleagues, and flexibility emerged as facilitating participants in their use of creative behavior. Other strategies included giving students a choice of assessments, giving ample time for the project or ideation, and offering many hands-on projects throughout the school year. The study found that problematic factors included time constraints and teacher duties. Also, standardized testing, such as Virginia's Standards of Learning (SOLs), appeared to challenge some of the participants'

creativity and made it difficult for some to merge their understandings of students' needs with current policies of accountability.

Implications for Practice and Policy

Given the exploratory nature of the research, these findings cannot be generalized beyond the participants of the school in the study. However, tentative implications for educational policy may be suggested. Several of these are outlined below.

Questions of current practice focus on the development of creativity: If access to factors of creativity-fostering behaviors facilitates creativity in the classroom, how does a teacher acquire them? What is the role of pre-service and in-service professional development regarding creativity? Do higher education institutions have a responsibility to their teachers to attempt to develop any or all of the factors of creativity-fostering teacher behaviors? If the development of creativity continues to be left to individual teacher experience, will teachers become transformed into 'drill sergeants' as they 'teach to the test'? Will the education profession "force teachers to spend more time on test-prep and drill-and-kill exercises rather than on authentic teaching and learning" (Fusarelli, 2004, p. 4) without creativity? If teachers only cultivate the creativity-fostering behaviors of Evaluation and Judgment, will "work sheets become a substitute for critical teaching and rote memorization takes the place of in-depth thinking" (Giroux & Le Schmidt, 2004, p. 10) in our classrooms? Will those teachers that do not hone their creativity-fostering behaviors skills of Question, Opportunities, and Motivation resort to teaching "a cookbook kind of approach—do this, do that, get those skills ingrained" for students to pass standardized tests

(Perreault, 2000, p. 708)? However, what if professional development is offered at the pre- and in-service levels of teaching? Which model of creativity should be utilized? Which model promotes teacher quality to the current diverse population of students?

Questions of policy deal with support for teachers' creativity-fostering behavior ability. Teacher 13 noted, "The schools and creativity just doesn't [sic] work...when you hold them in this institutionalized setting, this factory setting." What will allow schools to grow beyond current policies produced by the prevalent 'factory model,' to create professional environments that are supportive of teachers' creativity-fostering behaviors?

Beyond allowing creativity-fostering behaviors to occur in their facilities, how else can administrations contribute to the formulation of local policies that support teacher creative abilities? How can policy makers design accountability systems that do not impede teachers' abilities to foster creativity and address the needs of the students? How will the support of creativity-fostering behaviors affect teacher retention or the pool of qualified teachers? What will support of creative abilities have on the state of America's educational system or society?

Some of the teacher participants offered suggestions for teacher professional development. Teacher 13 stressed the value of learning the concept of teacher self-critique. "You have to be open minded. You have to admit if you're wrong or if something is not working, you have to change it. Just scrap it if it is something that hasn't worked out. Admit that you're wrong." In addition to critique, Teacher 13 emphasized the importance of collaboration; an aspect that Teacher 22 believes should be developed through professional development. "To bring different

departments together and get them to have 'cross-talk': things we can do together with joint projects." Teachers 1 and 25 called attention to the development of "Thought-provoking analyses of data and information" as well as "teachers need to force questions on the students, not just give them answers. That way we get students who can ask questions themselves."

Several of the participants would also benefit from a redistribution of time during the school day. Many teachers lamented the lack of time they had to spend collaborating with colleagues teaching within the same core as well as those that could assist with cross-disciplinary activities. However, time allocation is an issue that continues to vex most principals.

Implications for Practice

In terms of practice, school districts and local universities can facilitate teacher opportunities for mastery experiences with creativity. These experiences should be core subject-specific, should include a practicum in teaching with specific strategies, and should offer co-teaching experiences with master teachers in classroom creativity. Teachers can demonstrate and show confidence with creativity-fostering behaviors if they are exposed to opportunities that allow for mastery experiences. This, in turn, leads to motivated students and a heightened level of cognitive development.

Additionally, Soh's CFT Index Observation Scale can be used as a self assessment and professional growth form. Follow-up conferences organized around the observation tool can monitor the conclusion of observations. Information taken

from the Observation Scale over many observations can become a guide for needed professional development.

Implications for Future Research

As an exploratory study on behaviors of teachers that foster creativity, and in spite of the limited generalizability of the study to other secondary teachers because of the small sample size, tentative implications for future research are suggested by this study.

This research preliminarily supports the use of Soh's CFT Index as an observation tool. The form was specifically designed for examining creativity-fostering behaviors as they occur in the classroom. Future studies with larger, more generalizable samples could use this observation tool to conduct a more in-depth program of qualitative research. Additional observation time would permit the investigator to observe more creativity fostering behaviors. Conclusions could then begin to be drawn about the circumstances under which specific strategies are used in classrooms.

Future research could also explore the creative abilities and experiences of administration and the relationship this has to policy decisions, new hires, and the administrative-faculty relationship. In this study, Teacher 11 admired her administrator for supporting her creativity in the classroom. Teacher 25 described her administrator as "really supportive of what you want to do." However, one participant criticized the administrative decision to place "well qualified teachers" at the entrance of the high school to ensure that visitors revealed their picture identification and signed in and out of the appropriate binder. The interview participants clearly

expected the administration to support teachers and their role in fostering creativity in the classroom.

Finally, the conclusions of this exploratory study, based on the findings of the investigator, suggest that standardized testing, particularly NCLB, challenges many of the participants' creativity-fostering behavior abilities. It also appears that some of these teachers find it difficult to resolve the problem of teaching students according to their needs while aligning with current policies of accountability. Within the framework of NCLB, administrators are beginning to seek out initiatives such as differentiation. These initiatives appear to require the creativity-fostering behaviors of teachers as well as collaboration between teachers within a school. Research on how these initiatives are interpreted by teachers and administrators and to what extent creative abilities and collaboration are then used would offer insight into the soundness of these plans.

Summary

Creativity is essential to instructor success in teaching our students. Providing our teachers with opportunities to master teaching with creativity as well as instructing teachers' in appropriate behaviors to foster creativity in the classroom will lead to broadening our students' higher level thinking skills. The purpose of this exploratory study was to extend the literature in the field of education regarding creativity-fostering, secondary teachers' instructional strategies and behaviors in the high-stakes standardized testing environment, emphasized by the recent No Child Left Behind Act of 2001 (NCLB).

Creativity is a concept that continues to warrant a position at the forefront of education, but fails to receive sufficient attention through professional development offerings. Teachers play an incredibly important role in developing the future of our diverse students, and essentially our nation. As Cropley (2001) states: "Foster[ing] creativity…should underlie all teaching and learning in all subject areas and at all times" (p. 151).

References

Albert, R.S. (1990). Identity, experiences, and career choice among the exceptionally gifted and talented. *In M.A. Runco & R.S. Albert (Eds.), Theories of Creativity.* (pp.13-34). Newbury Park, CA: Sage.

Alencar, E.M.L.S. (1993). *Criatividade [Creativity]*. Brasilia, Brazil: EDUnB.

Amabile, T.M. (1983). *The social psychology of creativity*. New York: Springer-Verlag.

Amabile, T.M. (1988). A model of creativity and innovation in organizations. In B.M. Staw and L.L. Cummings (Eds.). *Research in organizational behavior* (Vol. 10, pp. 123-167). Greenwich, CT: JAI Press.

Amabile, T.M. (1989). *Growing up creative.* Buffalo, NY: The Creative Education Foundation.

Amabile, T.M., & Sensabaugh, S.J. (1992). High creativity versus low creativity: What makes the difference? In S.S. Gryskiewicz and D.A. Hills (Eds.), *Readings in innovation.* (pp. 123-1337). Greensboro, NC: Center for Creative Leadership.

Angleoska-Galeveska, N. (1996). Children's creativity in the pre-school institutions in Macedonia. *Childhood Education: International Perspectives.*

Archambault, F. X., Westberg, K. L., Brown, S. W., Hallmark, B. W., Zhang, W., & Emmons, C. L. (1993). Classroom practices used with gifted third and fourth grade students. *Journal for the Education of the Gifted, 16*(2), 103-119.

Arnold, H.J. & Feldman, D.C. (1981). Social desirability response bias in self-report choice situations. *Academy of Management Journal, 24* (2), 377-285.

Baker, P. (2002, December 15). *No Child Left Behind: Implications for the future of Illinois public education.* Synopsis of presentation presented at the Illinois Economic Development Conference, Illinois State University, Normal. Retrieved April 26, 2006, from http://coe.ilstu.edu/edpolctr/NCLB.htm

Barksdale-Ladd, M.A., & Thomas, K.F. (2000). What's at stake in high-stakes testing: Teachers and parents speak out. *Journal of Teacher Education, 51*, 382-397.

Borg, W.R., & Gall, M.D. (1989). *Educational research: An introduction.* (5th Ed.). New York, NY: Longman.

Broadfoot, P. (1996). *Education, assessment and society: A sociological perspective.* Philadelphia: Open University.

Coleman, M. R., & Gallagher, J. J. (1995, September/October). Appropriate differentiated services. *Gifted Child Today*, 32-33.

Collins, M.A., & Amabile, T.M. (1999). Motivation and creativity. In R.J. Sternberg (Ed.), *Handbook of Creativity* (pp. 297-312). New York: Cambridge University Press.

Craft, A. (2000). *Creativity across the primary curriculum.* London: Routledge.

Creswell, J.W. (1994). *Research design: Qualitative & quantitative approaches.* London: Sage.

Creswell, J.W. (2002). Mixed method designs. In J.W. Creswell (Ed.), *Educational research: planning, conducting, and evaluating quantitative and qualitative research* (2nd ed., pp.559-601). Upper Saddle River, NJ: Prentice Hall.

Creswell, J.W. (2007). *Educational research: planning, conducting, and evaluating quantitative and qualitative research.* 3rd ed. Upper Saddle River, NJ: Merrill Prentice Hall.

Cropley, A.J. (1997). Fostering creativity in the classroom: general principles. In M. A. Runco, (Ed.), *The Creativity Research Book.* Volume One. Cresskill, NJ: Hampton Press.

Cropley, D.H., & Cropley, A.J. (2000). Fostering creativity in engineering students. *High Abilities Studies, 11*(2), 207-218.

Csikszentmihalyi, M. (1988). Society, culture, and person: A systems view of creativity. In R.J. Sternberg (Ed.), *The nature of creativity* (pp. 325-339). New York: Cambridge University Press.

Csikszentmihalyi, M. (1991). *Flow: The psychology of optimal experience.* New York: Harper Collins.

Csikszentmihalyi, M. (1996). *Creativity.* New York: Harper Collins.

Dadds, M. (1993). The feeling of thinking in professional self-study. *Educational Action Research, 1*(2), 287-303.

Dadds, M. (1995, Autumn/Winter). Continuing professional development: Nurturing the expert within. *Cambridge Institute of Education Newsletter, 30*, 23-27.

Daniels, S. (1997). Creativity in the classroom: Characteristics, climate, and curriculum. In N. Colangelo & G.A. Davis (Eds.), *Handbook of gifted education* (2nd ed., pp. 292-307). Needham Heights, MA: Allyn and Bacon.

Day-Vines, N. L., & Patton, J. M. (2003, February-March). The perils, pitfalls, and promises of the No Child Left Behind Act of 2001: Implications for the

education of African American and other minority learners. *T/TAC Link Lines*, 1-5.

de Bono, E. (1985). *Six thinking hats*. Boston: Little, Brown, and Co.

Delcourt, M. (1994). Characteristics of high level creative productivity: A longitudinal study of students identified by Renzulli's Three-Ring Conception of Giftedness. In R. Subotnik & K.D. Arnold (Eds.). *Beyond Terman: Contemporary studies of giftedness and talent.* (pp. 401-436). Norwood, NJ: Ablex.

de Souza Fleith, D. (2000). Teacher and student perceptions of creativity in the classroom environment. *Roeper Review*, *22*(3), 148-153.

Diezmann, C.M., & Watters, J.J. (2002). The importance of challenging tasks for mathematically gifted students. *Gifted and Talented International, 17*(2), 76-84.

Edwards, C.P., & Springate, K.W. (1995). *Encouraging creativity in early childhood classrooms.* Washington, DC: Office of Educational Research and Improvement.

Ehlers, K., & Montgomery, D. (1999). *Teachers' perceptions of curriculum modification for students who are gifted.* U.S.; Oklahoma: Retrieved March 14, 2007, from ERIC database.

Eindhoven, J.E., & Vinacke, W.E. (1952). Creative process in painting. *The Journal of General Psychology, 47*, 139-164.

Eisenberger, R., & Armeli, S. (1997). Can salient reward increase creative performance without reducing intrinsic creative interest? *Journal of Personality and Social Psychology, 72*(3), 652-663.

Eriksson, G.I. (1989). Developing creative thinking through an integrated arts programme for talented children. *Gifted Education International, 6*, 8-15.

Feldhusen, J.F. (1995). Creativity: A knowledge base, metacognitive skills, and personality. *Creative Behavior, 29*(4), 255-266.

Feldhusen, J.F. (2001). Multiple options as a model for teaching the creatively gifted child. In M.D. Lynch & C.R. Harris (Eds.), *Fostering creativity in children, K-8* (pp. 3-13). Needham Heights: Allyn & Bacon.

Feldman, D. (1986). *Nature's gambit: Child prodigies and the development of human potential.* New York: Basic Books.

Fernald, L.W. (1988). The underlying relationship between creativity, innovation and entrepreneurship. *Journal of Creative Behavior, 22,* 196-202.

Festinger, L. (1957). *A theory of cognitive dissonance.* Evanston, IL: Row Peterson.

Firestone, W.A. (2001). Testing, testing: Politics and effects. *Politics of Education Bulletin, 25*(1), 1-4.

Firestone, W.A., Monfils, L., & Schorr, R.Y. (2004) Test preparation in New Jersey: Inquiry-oriented and didactic responses. *Assessment in Education: Principles, Policy and Practice. 11(1)* 67-88.

Friedman, R.C., & Lee, S.W. (1996). Differentiating instruction for high-achieving/gifted children in regular classrooms: A field test of three gifted-education models. *Journal for the Education of the Gifted, 19*(4), 405-436.

Fryer, M. (1996). *Creative teaching and learning*. London: Paul Chapman Publishing Ltd.

Fullan, M. (2001). *Leading in a culture of change*. San Francisco, CA: Jossey-Bass.

Fusarelli, L.D. (2004). The potential impact of the No Child Left Behind Act on equity and diversity in American education. *Educational Policy, 18*, 71-94.

Gagné, F. (1995). From giftedness to talent: A developmental model and its impact on the language of the field. *Roeper Review, 18*(2), 103-111.

Gagné, F. (2000). *A differentiated model of giftedness and talent. Year 2000 update.* ERIC Document Reproduction Service No. ED448544.

Gall, M., Gall, J., & Borg, R.B. (2003). *Educational research: an introduction*. 7th Edition. Boston, MA: Allyn and Bacon.

Galton, F. (1892). *Hereditary genius*. 2nd Edition. New York, NY: Macmillan.

Gardner, H. (1983). *Frames of mind: The theory of multiple intelligences*. New York: Basic Books.

Gardner, H. (1997). *Extraordinary minds.* New York: Basic Books.

Georgia Department of Education (2005). Retrieved March 25, 2006, from http://doe.k12.ga.us/support/plan/nclb.asp

Getzels, J., & Csikszentmihalyi, M. (1977). *The creative vision.* Chicago: University of Chicago.

Getzels, J., & Jackson, P. (1962). *Creativity and intelligence: Explorations with gifted students.* New York: Wiley.

Giroux, H.A., & Le Schmidt, M. (2004). Closing the achievement gap: A metaphor for children left behind. *Journal of Educational Change, 5*(3), 213-228.

Glasser, B., & Strauss, A. (1967) *The discovery of grounded theory*. Chicago; Adeline.

Gordon, S.P., & Reese, M. (1997, July). High stakes testing: Worth the price? *Journal of School Leadership, 7*, 345-368.

Greenberg, E. (1992). Creativity, autonomy, and evaluation of creative work: Artistic workers in organizations. *Journal of Creative Behavior, 26*(2), 75-80.

Gowan, J.C. (1972). *The development of the creative individual*. San Diego: Robert R. Knapp.

Guilford, J.P. (1950). Creativity. *American Psychologist*, 5, 444-454.

Halliwell, S. (1993). Teacher creativity and teacher education. In D. Bridges & T. Carey (Eds.). *Developing teachers professionally*. London: Routledge.

Haney, W. (2000). The myth of the Texas Miracle in education. *Education Policy Analysis Archives [On-line serial] 8*(41). Retrieved March 6, 2007 from http://epaa.asu.edu/epaa/v8n41/.

Hansen, J.B., & Feldhusen, J.F. (1994). Comparison of trained and untrained teachers of gifted students. *Gifted Child Quarterly, 38*(3) 115-123.

Hargreaves, A. (2003). *Teaching in the knowledge society. Education in the age of insecurity*. New York: Teachers College Press.

Heacox, D. (2002). *Differentiating instruction in the regular classroom: How to reach and teach all learners, grades 3-12*. Minneapolis, MN: Free Spirit.

Hertzog, N. B. (2004). Open-ended activities: Differentiation through learner responses. In C.A. Tomlinson (Ed.), *Differentiation for gifted and talented students* (pp. 77-103). Thousand Oaks, CA: Corwin Press.

Hollingsworth, L. (1942). *Children above 180 IQ Stanford Binet: origin and development.* Yonkers on Hudson: World Book.

Holstein, J., & Gubrium, J. (1995). *The active interview.* Thousand Oaks, CA: Sage.

Isaksen, S.G. (1995). *Some recent developments on assessing the climate for creativity and change.* Paper presented at the International Conference on Climate for Creativity and Change, Buffalo, NY.

Isaksen, S.G., & Treffinger, D.J. (1985). *Creative problem-solving: The basic course.* Buffalo, NY: Bearly.

Jensen, A.R. (1996). Giftedness and genius: Crucial differences. In C.P. Benbow and D. Lubinski (Eds.), *Intellectual talent: Psychometric and social issues.* Baltimore, MD: Johns Hopkins University.

Jones, B.D., & Johnson, A.F. (2002, April). *The effects of high-stakes testing on instructional practices.* Paper presented at the Annual Meeting of the American Educational Research Association, New Orleans, LA.

Jones, M.G., Jones, B.D., & Hargrove, T.Y. (2003). *The unintended consequences of high stakes testing.* Lanham, MD: Rowan & Littlefield.

Kanter, R.M. (1983). *The change masters: Innovation for productivity in the American corporation.* New York: Simon Shuster.

Kaplan, S.N. (1979). *In-service training manual: Activities for developing curriculum for the gifted and talented.* Los Angeles: National/State Leadership Training Institute on the Gifted and Talented.

Kaplan, S. (1986). The grid: A model to construct differentiated curriculum for the gifted. In J. S. Renzulli (Ed.), *Systems and models for developing programs*

for the gifted and talented (pp. 180-193). Mansfield Center, CT: Creative Learning Press.

Kertzberg, R.L., & Reale, A. (1999). Using Torrance's problem identification techniques to increase fluency and flexibility in the classroom. *Journal of Creative Behavior, 33*(3), 202-07.

Landrum, G.N. (1993). *Profile of genius: Thirteen creative men who changed the world.* New York: Prometheus Books.

Leistyna, P., Lavandez, M., and Nelson, T. (2004). Introduction - critical pedagogy: revitalizing and democratizing teacher education. *Teacher Education Quarterly, 31*(1) Winter, 3-15.

Lewis, G. (1991). The need to create: constructive and destructive behavior in creativity gifted children. *Gifted Educational International*, 7, 62-68.

Lewis, J.F. (1982 May/June). Bulldozers or chairs? Gifted students describe their ideal teacher. *The Gifted Child Today*, 16-19.

Lynch, E., & Hanson, M. (1998). *Developing cross-cultural competence: a guide for working with children and their families.* Baltimore, MD: Paul H. Brookes Publishing.

Marland, S.P. (1972). *Education of the gifted and talented.* Report to the Congress of the United States by the U.S. Commissioner of Education. Washington, DC: U.S. Government Printing Office.

McCormack, A. (1975). Nonverbal administration protocols for figural tasks of the Torrance tests of creative thinking. *Journal of Creative Behavior*, 9, 88-96.

McNeil, L. & Valanzuela, A. (2001). The harmful impact of the TAAS system of testing in Texas: Beneath the accountability rhetoric. In G. Orfield & M. Kornhaber (Eds.), *Raising standards or raising barriers? Inequality and high stakes testing in public education.* 127-150. New York: The Century Foundation.

Merriam-Webster's Online Dictionary. (2007). Retrieved March 17, 2007 from http://www.m-w.com/

Milgram, R.M., & Hong, E. (1994). Creative thinking and performance in adolescents as predictors of creative attainment in adults: a follow-up study after 18 years. In R. Subotnik & K.D. Arnold (Eds.) *Beyond Terman: Contemporary studies of giftedness and talent.* (pp. 282-315), Norwood, NJ: Ablex.

No Child Left Behind Act of 2001, Pub. L. No. 107-110, [section] 115, Stat. 1425-2094. (2001).

Ochse, R. (1990). *Before the gates of excellence: The determinants of creative genius.* Cambridge, MA: Cambridge University.

Osborn, A.F. (1963). *Applied imagination* (3rd ed.). New York: Scribner's.

Osterman, K.F., & Kottkamp, R.B. (2004). Reflective practice for educators: professional development to improve student learning (2nd). Thousand Oaks, CA: Corwin Press.

Parnes, S.J. (1967). *Creative behavior guidebook.* New York: Scribner's.

Parnes, S.J. (1975). A program for balanced growth. *Journal of Creative Behavior*, 9, 23-28.

Parnes, S.J. (1981). *Magic of your mind.* Buffalo, NY: Bearly.

Passow, A.H. (1982). Differentiated curricula for gifted/talented: A point of view. In S. Kaplan, A.H. Passow, P.H. Phenix, S. Reis, J.S. Renzulli, I. Sato, L. Smith, E.P. Torrance, & V.S. Ward, *Curricula for the gifted* (pp. 1-21). Ventura, CA: National/State Leadership Training Institute on the Gifted/Talented.

Patrick, C. (1941). Whole and part relationship in creative thought. *American Journal of Psychology*, 54, 128-131.

Pedhazur, E.J., & Schmelkin, L.P. (1991). *Measurement, design, and analysis: An integrated approach*. Hillsdale, NJ: Lawrence Erlbaum and Associates.

Perkins, D. (1988). The possibility of invention. In R. Sternberg (Ed.), *The nature of creativity.* New York: Cambridge.

Perkins, D. (1999). The many faces of constructivism. *Educational Leadership, 57*(3), 6-11.

Perreault, G. (2000). The classroom impact of high-stakes testing. *Education, 120*, 705-710.

Perry-Smith, J.E., & Shalley, C.E. (2003). The social side of creativity: A static and dynamic social network perspective. *Academy of Management Review, 28*, 89-106.

Piirto, J. (1992). *Understanding those who create*. Dayton, OH: Ohio Psychology Press.

Piirto, J. (1994). *Talented children and adults: Their development and education*. 2nd Edition. Columbus, Ohio: Merrill.

Piirto, J. (1998). *Understanding those who create.* 2nd Ed. Tempe, AZ: Gifted Psychology Press.

Plucker, J.A., & Goreman, M.E. (1999). Invention is in the mind of the adolescent. Effects of a summer course one year later. *Creative Research Journal*, 12, 141-150

Raina, M.K. & Vats, A. (1979). Creativity, teaching style, and pupil control. *The Gifted Child Quarterly*, XXIII, (4) 807-811.

Reis, S.M., Westberg, K.L., Kulikowich, J., Caillard, F., Hebert, T., Plucker, J., Purcell, J.H., Rogers, J.B., & Smist, J. M. (1993). *Why not let high ability students start school in January?* The curriculum compacting study (Research Monograph No. 93106). Storrs, CT: The National Research Center on the Gifted and Talented, University of Connecticut.

Rekdal, C.K. (1979). Genius, creativity, and eminence. *Gifted Child Quarterly, 23*(4), 837-857.

Renzulli, J.S. (1977). *The enrichment triad model: a guide for developing defensible programs for the gifted and talented.* Mansfield Center, CT: Creative Learning Press.

Renzulli, J.S. (1978). What makes giftedness? Re-examining a definition. *Phi Delta Kappan,* 60, 180-184.

Renzulli, J.S. (1980). Will the gifted child movement be alive and well in 1990? *Gifted Child Quarterly, 24*(1), 3-9.

Renzulli, J.S. (1986). The three-ring conception of giftedness: A developmental model for creative productivity. In R.J. Sternberg & J.E. Davidson (Eds.) *Conceptions of giftedness.* (pp 53-92). New York, NY: Cambridge University Press.

Renzulli, J., & Callahan, C. (1973). Developing creativity training activities. *The Gifted Child Quarterly*, XIX (1), 38-45.

Renzulli, J.S. (1997, July). Five dimensions of differentiation. Keynote presentation at the 20th Annual Conference, Storrs, CT.

Rhodes, M. (1961). An analysis of creativity. *Phi Delta Kappan*, 42, 305-310.

Riley, T.L. (1997, January/February). Tools for discovery: Conceptual themes in the classroom. *Gifted Child Today*, 30-33.

Rogers, C.R. (1961). *On becoming a person: A therapist's view of psychotherapy.* Boston: Houghton Mifflin.

Rotter, J.B. (1975). Some problems and misconceptions related to the construct of internal versus external control of reinforcement. *Journal of Consulting and Clinical Psychology,* 43, 56-67.

Schmidt, T., Goforth, E., & Drew, K. (1975). Creative dramatics and creativity: an experimental study. *Educational Theatre Journal*, 27, 111-114.

Schutz, P.A., Crowder, K.C., & White, V.E. (2001). The development of a goal to become a teacher. *Journal of Educational Psychology, 93*(12), 299.

Shallcross, D.J. (1981). *Teaching creative behaviour: How to teach creativity in children of all ages.* Englewood Cliffs, NJ: Prentice-Hall.

Smith, M.L., & Rottenberg, C. (1991). Unintended consequences of external testing in elementary schools. *Educational Measurement: Issues and Practice, 10*(4), 7-11.

Soh, K.C. (2000). Indexing creativity fostering teacher behavior: A preliminary study. *Journal of Creative Behavior*, *34*(2)118-135.

Soh, K.C. (2007). *The Validity of the Creativity Fostering Teaching Behavior Index (CFTIndex): Further Evidence from Hong Kong.* Unpublished Article.

Starko, A.J. (1995). *Creativity in the classroom.* White Plains, NY: Longman.

Sternberg, R. (1985). *Beyond IQ: A triarchic theory of human intelligence.* New York: Cambridge University.

Sternberg, R.J. (2000). Creativity in a decision. In A.L. Costa (Ed.). *Teaching for intelligence II*, pp. 85-106. Arlington Heights, IL: Skylight Training and Publishing.

Sternberg, R.J. (2003). Creative thinking in the classroom. *Scandinavian Journal of Educational Research, 47*(3), 325-338.

Sternberg, R.J., & Lubart, T. (1991). An investment theory of creativity and its development. *Human Development, 34*, 1-31.

Sternberg, R.J., & Lubart, T. (1995). *Defying the crowd: Cultivating creativity in a culture of conformity.* New York: The Free Press.

Sternberg, R.J., & Williams, W.M. (1996). *How to develop student creativity.* Alexandria, VA: Association for Supervision and Curriculum Development.

Tannenbaum, A. (1986). The enrichment matrix model. In *Systems and models for developing programs for the gifted.* (pp. 216-266). J. Renzulli (Ed.). Guilford, CT: McGraw-Hill.

Terman, L.M. (1925). *Genetic studies of genius: Mental and physical traits of a thousand gifted children.* 2nd edition. CA: Stanford University Press.

Terman, L.M. (1954). Scientists and non-scientists in a group of 800 gifted men. *Psychological Monographs, 68*(7), 1-44.

Terman, L.M., & Oden, M.H. (1959). *The gifted group at mid-life: 35 years follow-up of the superior child.* Stanford, CA: Stanford University.

Terry, A.W. (2000). A case study of community action service learning on young, gifted adolescents and their community. *Dissertation Abstracts International,* 61(8), 3058A. (UMI No. AAT 9984217).

Tieso, C. (2005). The effects of grouping practices and curricular adjustments on achievement. *Journal for the Education of the Gifted,* 29, 60-89.

Timberlake, P. (1982). Fifteen ways to cultivate creativity in your classroom. *Childhood Education, 59,* 19-21.

Tomlinson, C.A., Tomchin, E.M., Callahan, C.M., Adams, C.M., Pizzat-Tinnin, P., Cunningham, C.M., Moore, B., Lutz, L., Roberson, C.; Eiss, N., Landrum, M., Hunsaker, S., & Imbeau, M. (1994). Practices of preservice teachers related to gifted and other academically diverse learners. *Gifted Child Quarterly, 38*(3), 106-114.

Tomlinson, C.A. (1995). Deciding to differentiate instruction in middle school: One school's journey. *Gifted Child Quarterly, 39,* 77-87.

Tomlinson, C., Moon, T., & Callahan, C. (1997). Use of cooperative learning at the middle level: Insights from a national survey. *Research in Middle Level Education. 20*(4), 37-55.

Tomlinson, C.A. (1999). *The differentiated classroom: responding to the needs of all learners.* Alexandria, VA: Association for Supervision and Curriculum Development.

Tomlinson, C.A., & Allan, S.D. (2000). *Leadership for differentiating schools and classrooms.* Alexandria, VA: Association for Supervision and Curriculum Development.

Tomlinson, C.A. (2001). *How to differentiate instruction in mixed-ability classrooms.* Alexandria, VA: Association for Supervision and Curriculum Development.

Torrance, E.P. (1962). *Guiding creative talent.* Englewood Cliffs, NJ: Prentice-Hall.

Torrance, E.P. (1970). *Encouraging creativity in the classroom.* Dubuque, IA: William C. Brown.

Torrance, E.P. (1983). *Creativity in the classroom*. Washington, DC: National Education Association.

Treffinger, D.J., Isaksen, S.G., & Dorval, K.B. (1997). *Creative problem-solving: An introduction* (3rd ed.). Sarasota, FL: Center for Creative Learning.

Urban, K.K., & Jellen, H.G. (1996). *Test for creative Thinking – Drawing Production.* Lisse, The Netherlands: Swets and Zeitlinger.

Van Manen, M. (1977). Linking ways of knowing with ways of being practical. *Curriculum Inquiry, 6*, 205-228.

VanTassel-Baska, J. (1998). Creativity and the gifted. In J. VanTassel-Baska (Ed.) *Excellence in educating gifted learners*. (3rd edition). (pp.381-398), Denver: Love.

VanTassel-Baska, J. (2002). *Differentiating the language arts for high ability l3earners*. Retrieved January 15, 2008 from http://www.cec.sped.org/AM/Template.cfm?Section=Home&TEMPLATE=/CM/ContentDisplay.cfm&CONTENTID=1605

VanTassel-Baska, J., Avery, L., Struck, J., Feng, A., Bracken, B., Drummond, D., et al. (2003). *The William and Mary classroom observation scales revised (COS-R).* Williamsburg, VA: Center for Gifted Education.

VanTassel-Baska, J., Quek, C., & Feng. A. (2005). *Classroom observation scale – revised: Preliminary user's manual.* Williamsburg, VA: Center for Gifted Education.

VanTassel-Baska, J., Quek, C., & Feng. A. (2007). The development and use of a structured teacher observation scale to assess differentiated best practice. *Roeper Review, 29(*2) 84-92.

Wallach, M. & Kogan, N. (1969). *Modes of thinking in young children: A study of the creativity-intelligence distinction.* New York: Holt, Rinehart, & Winston.

Wallas, G. (1926). *The art of thought.* New York, NY: Harcourt Brace.

Wallbrown, F. & Huelsman, C. (1975). The validity of the Wallach-Kogan creativity operations for inner-city children in two areas of visual art. *Journal of Personality, 43,* 109-126.

Ward, V.S. (1961). *Finding the gifted: An axiomatic approach.* Columbus, OH: Merrill.

Ward, V.S. (1980). *Differential education for the gifted.* Columbus, OH: Merrill.

Westberg, K.L., Archambault, F.X., Dobyns, S.M., & Salvin, T.J. (1993). The classroom practices observational study. *Journal for the Education of the Gifted, 16*(2), 120-146.

Westberg, K.L., & Daoust, M.E. (2003, Fall). The results of the replication of the classroom practices survey replication in two states. *The National Research Center on the Gifted and Talented Newsletter*, 3–8.

Wideen, M.F., O'Shea, O., Pye, I, & Ivany, G. (1997). High-stakes testing and the teaching of science. *Canadian Journal of Education, 22*(4), 428-444.

Woods, P., & Jeffrey, B. (1996). *Teachable moments: The art of teaching in primary schools.* Buckingham, UK: Open University Press.

Worley, B.B.II. (2006). Talent development ion the performing arts: Teacher characteristics, behaviors, and classroom practices. *Dissertation Abstracts International,* (UMI No. 3209553).

Appendix A

Principal Participation Email

-----Original Message-----
From: Matthew Edinger
Sent: Thursday, May 24, 2007 5:13 PM
To:
Cc: Matthew Edinger
Subject: Dissertation Study - A follow up from our 2005 interview

Dear:

My name is Matt Edinger and I'm an 8th grade English teacher at Middle School.

I interviewed you for a doctoral level Creativity class I was taking at William and Mary in November 2005. Since then, I have completed my courses and passed my written and oral comprehensive exams. I am finally at the dissertation stage and I'm emailing to see if you would allow me to conduct my dissertation study in your high school during the next school year.

Your involvement would consist of:

- allowing me to have approximately 20 minutes of access to your 9th and 10th grade core subject teachers early in the 2007-2008 school year (to complete a 45-item survey)

- allowing me to interview and complete two classroom observations of willing teachers who score within the top 50th percentile of the survey (approximately 6-8 teachers) between the months of October and February.

Dr. [ ], Manager of School Improvement/Instructional Support at [School District], has approved my dissertation study and suggested that I email you to request a brief meeting to discuss my study.

Please let me know if you are willing to allow me to complete my dissertation study in your school next year. I would like to explain the details to you and answer your questions when you have time.

Thank you!

Sincerely,

Matt Edinger

Appendix B

CFT Index

Name:

Different teachers have different teaching styles. They also handle students' ideas and learning problems differently. What, then, is your style? Please read each statement below and circle one of the six codes to indicate how often you do it.

All the time 6 5 4 3 2 1 Never

1. I encourage students to show me what they have learned on their own.
   6 5 4 3 2 1

2. In my class, students have opportunities to share ideas and views.
   6 5 4 3 2 1

3. Learning the basic knowledge/skills well is emphasized in my class.
   6 5 4 3 2 1

4. When my students have some ideas, I get them to explore further before I take a stand. **6 5 4 3 2 1**

5. In my class, I probe students' ideas to encourage thinking.
   6 5 4 3 2 1

6. I expect my students to check their own work instead of waiting for me to correct them. **6 5 4 3 2 1**

7. I follow up on my students' suggestions so that they know I take them seriously. **6 5 4 3 2 1**

8. I encourage my students to try out what they have learned from me in different situations.
   6 5 4 3 2 1

9. My students who are frustrated can come to me for emotional support.
   6 5 4 3 2 1

10. I teach my students the basics and leave them to find out more for themselves.
    6 5 4 3 2 1

11. Students in my class have opportunities to do group work regularly.
    6 5 4 3 2 1

12. I emphasize the importance of mastering the essential knowledge and skills.
6 5 4 3 2 1
13. When my students suggest something, I follow it up with questions to make them think further.
6 5 4 3 2 1

14. I encourage my students to ask questions freely even if they appear irrelevant.
6 5 4 3 2 1

15. I provide opportunities for my students to share their strong and weak points with the class. **6 5 4 3 2 1**

16. When my students have questions to ask, I listen to them carefully.
6 5 4 3 2 1

17. When my students put what they've learnt into different uses, I appreciate them. **6 5 4 3 2 1**

18. I help students who experience failure to cope with it so that they regain their confidence. **6 5 4 3 2 1**

19. I leave questions for my students to find out for themselves.
6 5 4 3 2 1

20. Students in my class are encouraged to contribute to the lesson with their ideas and suggestions.
6 5 4 3 2 1

21. My students know that I expect them to learn the basic knowledge and skills well. **6 5 4 3 2 1**

22. I do not give my view immediately on students' ideas, whether I agree or disagree with them.

6 5 4 3 2 1

23. I encourage my students to think in different directions even if some of the ideas might not work.
6 5 4 3 2 1

24. My students know that I expect them to check their own work before I do.
6 5 4 3 2 1

25. My students know that I do not dismiss their suggestions lightly.
6 5 4 3 2 1

26. My students are encouraged to do different things with what they have learned in class. **6 5 4 3 2 1**

27. I help my students to draw lessons from their own failures.
6 5 4 3 2 1

28. I teach students the basics and leave room for individual learning.
6 5 4 3 2 1

29. I encourage students to ask questions and make suggestions in my class.
6 5 4 3 2 1

30. Moving from one topic to the next quickly is *not* my main concern in class.
6 5 4 3 2 1

31. I comment on students' ideas only after they have been more thoroughly explored. **6 5 4 3 2 1**

32. I like my students to take time to think in different ways.
6 5 4 3 2 1

33. In my class, students have opportunities to judge for themselves whether they are right or wrong.
6 5 4 3 2 1

34. I listen to my students' suggestions even if they are not practical or useful.
6 5 4 3 2 1

35. I don't mind my students trying out their own ideas and deviating from what I have shown them.
6 5 4 3 2 1

36. I encourage students who have frustration to take it as part of the learning process. **6 5 4 3 2 1**

37. I leave open-ended questions for my students to find the answers for themselves. **6 5 4 3 2 1**

38. Students in my class are expected to co-operatively work in groups.
6 5 4 3 2 1

39. Covering the syllabus is *not* more important to me than making sure the students learn the basics well.
6 5 4 3 2 1

40. I encourage students to do things differently although doing this takes up more time. **6 5 4 3 2 1**

41. I allow students to deviate from what they are told to do.
6 5 4 3 2 1

42. I allow my students to show one another their work before submission.
6 5 4 3 2 1

43. I listen patiently when my students ask questions that may sound silly.
6 5 4 3 2 1

44. Students are allowed to go beyond what I teach them within my subject.
6 5 4 3 2 1

45. I encourage students who experienced failure to find other possible solutions.
6 5 4 3 2 1

Thank you for your cooperation.

Appendix C

CFT Index Observation Scale

Creativity-Fostering Teacher Index – Observation Form

Observer _____ **Number of minutes observed** ____ **Date** _____

School _____ **Grade** _____ **Teacher** _____

Course/lesson observed _____

Total Number of students _____ **Males** _____ **Females** _____

Observed ethnicity:

Number of Caucasian _____ **African American**_____ **Hispanic**_____

Number of Asian American_____ **Number of other** _____

Classroom desk arrangement:

Desks in rows and columns ____ **Desks in groups** ____ **Desks in circle** _____

6 = Very Effective	**5 = Effective**	**4 = Marginally Effective**	
The teacher displayed vast classroom flexibility in implementation of creative behavior. The teacher was very clear, and sustained continued focus on the purposes of learning.	The teacher displayed classroom flexibility in implementation of creative behavior. The teacher was clear, and sustained focus on the purposes of learning.	The teacher displayed some classroom flexibility in implementation of creative behavior. The teacher was marginally clear and marginally focused on the purposes of learning.	
3 = Marginally Ineffective	**2 = Ineffective**	**1 = Very Ineffective**	**N/O = Not Observed**
The teacher displayed little classroom flexibility in implementation of creative behavior. The teacher was seldom clear and seldom sustained focus on the purposes of learning.	The teacher displayed random classroom flexibility in implementation of creative behavior. The teacher was unclear and unfocused regarding the purpose of learning.	The teacher displayed no classroom flexibility in implementation of creative behavior. The teacher was profoundly unclear and largely unfocused regarding the purpose of learning.	The listed creative behaviors were not demonstrated during the time of the observation. (NOTE: There must be an obvious attempt made for the certain behavior to be rated "ineffective" instead of "not observed".)

Creativity-Fostering Teacher - Observation Form							
The teacher...	**6**	**5**	**4**	**3**	**2**	**1**	**N/O**
Independence							
1.encouraged students to show what they have learned on their own							
2. taught students the basics and left them to find out more for themselves							
3. left questions for students to find out for themselves							
4. taught students the basics and left room for individual learning							
5. left open-ended questions for his/her students to find the answers for themselves							
The teacher...	**6**	**5**	**4**	**3**	**2**	**1**	**N/O**
Integration							
6. gave students opportunities to share ideas and views							
7. gave students opportunities to regularly work in a group							
8. encouraged students to contribute to the lesson with their ideas and suggestions							
9. encouraged students to ask questions and make suggestions							
10. had students who expected to work co-operatively in groups							
The teacher...	**6**	**5**	**4**	**3**	**2**	**1**	**N/O**
Motivation							
11. emphasized learning the basic knowledge/skills well							
12. emphasized the importance of mastering the essential knowledge and skills							
13. expected students to learn the basic knowledge and skills well							
14. main concern was not moving from one topic to the next quickly							
15. showed that covering the syllabus was *not* more important to him/her than making sure the students learn the basics well							
The teacher...	**6**	**5**	**4**	**3**	**2**	**1**	**N/O**
Judgment							
16. encouraged students to explore their ideas further before he/she took a stand							
17. followed up suggestions with questions to make them think further							
18. did not give his/her view immediately on students' ideas, whether he/she agreed or disagreed with them							
19. commented on students' ideas after they had been more thoroughly explored							
20. didn't mind his/her students trying out their own ideas and deviating from what he/she had shown them							

The teacher...	6	5	4	3	2	1	N/O
Flexibility							
21. probed students' ideas to encourage thinking							
22. encouraged students to ask questions freely even if they appear irrelevant							
23. encouraged students to think in different directions even if some of the ideas might not work							
24. liked his/her students to take time to think in different ways							
25. had students who knew that he/she expected them to check their own work before he/she did							
The teacher...	**6**	**5**	**4**	**3**	**2**	**1**	**N/O**
Evaluation							
26. expected his/her students to check their own work instead of waiting for him/her to correct them							
27. provided opportunities for students to share their strong and weak points with the class							
28. encouraged students to do things differently although doing this takes up more time							
29. allowed students to have opportunities to judge for themselves whether they were right or wrong							
30. allowed his/her students to show one another their work before submission							
The teacher...	**6**	**5**	**4**	**3**	**2**	**1**	**N/O**
Question							
31. followed up on student suggestions so that they know he/she takes them seriously							
32. listened carefully to student questions							
33. had students who knew that he/she do not dismiss their suggestions lightly							
34. listened to the students' suggestions even if they were not practical or useful							
35. listened patiently when students asked questions that may have sounded silly							
The teacher...	**6**	**5**	**4**	**3**	**2**	**1**	**N/O**
Opportunities							
36. encouraged students to try out what they have learned from him/her in different situations							
37. appreciated students when they put what they've learnt into different uses							
38. encouraged students to do different things with what they have learned in class							
39. allowed students to deviate from what they were told to do							
40. allowed students to go beyond what he/she taught them within the teacher's subject							

The teacher...	6	5	4	3	2	1	N/O
Frustration							
41. permitted frustrated students to come to them for emotional support							
42. helped students who experience failure to cope with it so that they regain their confidence							
43. helped students draw lessons from their own failures							
44. encouraged students who had frustration to take it as part of the learning process							
45. encouraged students who experienced failure to find other possible solutions							

Appendix D

Teacher Interview Protocol

1. How do you think the American public defines creativity?

2. How do you personally define creativity in students as demonstrated in classrooms?

3. What are some individual characteristics of teachers considered to foster creativity?

4. What strategies do you use to foster student creativity? Why?

5. What is the relationship between creativity and learning in the classroom?

6. What do you believe American school systems can do to enhance creativity-fostering?

7. Why do you believe that creativity should be fostered in k-12 students?

8. What is the relationship between your past experiences and creativity?

9. What factors facilitate your ability to foster creativity? In your classroom? In your school?

Appendix E

Teacher Participation Request Letter

October 2007

Dear:

My name is Matt Edinger and I am a doctoral candidate at The College of William and Mary. I am also a full time English teacher at Middle School, [Name] County's alternative education middle school. Thank you for participating in a dissertation that is examining teacher behaviors in the No Child Left Behind (NCLB) climate.

[Your principal] has agreed to allow me to undertake this study with 9th and 10th grade teachers at [Your High School]. Initial participation involves completing the attached teacher self-report forms. All forms should be returned in the manila envelope to **[your principal] by Wednesday, November7th**. Please peel your name off of the manila envelope before you return it to [your principal's] mailbox. I've included $2 as a token of my appreciation for your time. As an 8-year teacher in the county, I know that you are very busy.

Future participation in the study will involve a sample of teachers for follow-up interviews with the researcher conducted via face to face, email or phone. Classroom observations are also a requirement of the study.

Your identity and any responses you provide will remain confidential. The identity of your school will also remain confidential to protect those participating in the study. You have the right to discontinue participation at any time. You have the right to refuse to answer any questions asked of you. Your full cooperation, however, will be greatly appreciated and will also add to the optimum applicability of the study's findings.

Please contact me at matthew_edinger@ccpsnet.net if you have any questions or concerns. Also, my home phone is 555 5852.

Thank you for your time and consideration!

Sincerely,

Matt Edinger
Middle School
English Department Chair
743 3701

Enclosures:

_____ Two Teacher Consent Forms (Sign both, but please keep one for your records)

_____ Teacher Self-Report

_____ Teacher Demographic Form

Appendix F

Teacher Consent Form

Please initial the following indicating your agreement to participate in the study.

_____I, _____, agree to participate in a study that examines teacher behaviors in the No Child Left Behind (NCLB) climate. This study will provide insight into the specific strategies and skills used in present day classrooms. I understand that the researcher is conducting this study as a part of a doctoral dissertation at The College of William and Mary in Williamsburg, Virginia.

_____I understand that, if chosen, I will be expected to allow time for a face-to-face or email interview with the researcher, approximately one hour in length, as well as allow the researcher access to my classroom for at least two observations. Both of these events are greatly related to the study's purpose articulated above. I also agree to read and review a summary of the information (via email) generated during the interview and observations to check and correct for accuracy.

_____I have been informed that any information obtained from me for this study will be connected with a participant code that will allow only the researcher to identify my identity. At the conclusion of the study, the key that links me and all participants with the code will be destroyed. I also acknowledge that individual discussions will be audiotaped to ensure the accuracy of the data transcriptions. At the conclusion of the study, the tapes will be erased or destroyed and will no longer be available for use. All efforts will be made to conceal my identity in the study's report of results and to keep my personal information confidential.

_____I understand that I can choose not to answer any question to which I would rather not respond and that I am free to withdraw my consent and discontinue participation at any time during any stage of the study. My decision to participate or not participate will not affect my relationship with my school, colleagues, administration, the researcher, or with The College of William and Mary. My signature below signifies my voluntary participation in this project, that I have received a copy of this consent form, and that I agree to participate in the study.

If I have any questions, or if a problem arises, in connection with my participation in this study, I should contact Matt Edinger, the principal researcher, Dr. Joyce VanTassel-Baska, the Dissertation Committee chair, at 757 221 2347, or Dr. Michael Deschenes, the Chair of the Protection of Human Subjects Committee at The College of William and Mary, at 757 221 2778.

Date	Signature of Participant
Date	Signature of Investigator

THIS PROJECT WAS APPROVED BY THE COLLEGE OF WILLIAM AND MARY PROTECTION OF HUMAN SUBJECTS COMMITTEE (Phone 757-221-3966) ON 2007-10-22 AND EXPIRES ON 2008-10-22.

Appendix G

Teacher Demographic Form

All information provided will be kept confidential and will be used only for the purposes of this study. Your participation is greatly appreciated!

Please circle or indicate the appropriate response.

1. Gender: F or M

2. Age: ____

3. Ethnicity:
African-American
Asian-American
Caucasian-American
Hispanic-American
Native American
Other

4. Highest degree earned:
BA/BA
MA/MS
Educational Specialist
Ed.D/Ph.D.
Other

5. Years of teaching experience:
0-1
2-5
6-10
10-15
16-20
More than 20

Please write your answers in the blank.

6. What subjects and grades do you currently teach?

7. How long have you been teaching these grades?

8. How long have you been teaching these subjects?

9. Please list the other grades and subjects you've taught and how long you taught them.

10. Please list any teaching endorsements that you currently hold and have previously held.

11. Please list all education-related memberships that you have now or had in the past.

Thank you for your time!

Appendix H

Table 18

Descriptive Statistics of Participant CFT Index Survey Response

Scale *N=20*	*Mean*	*SD*	*Minimum*	*Maximum*
Teacher # 1	5.82	0.19	3	6
Teacher # 3	5.62	0.44	2	5
Teacher # 4	5.49	0.38	2	6
Teacher # 5	5.13	0.51	2	5
Teacher # 6	5.02	0.43	1	6
Teacher # 7	4.98	0.60	2	6
Teacher # 8	4.91	0.68	3	6
Teacher # 10	4.89	0.69	2	6
Teacher # 11	4.78	0.32	4	6
Teacher # 12	4.73	0.45	4	6
Teacher # 13	4.60	0.40	1	6
Teacher # 14	4.60	0.50	3	6
Teacher # 18	4.56	0.65	3	6
Teacher # 19	4.56	0.58	2	6
Teacher # 20	4.38	0.76	1	6
Teacher # 22	4.18	0.29	4	6
Teacher # 25	4.18	0.43	3	3
Teacher # 29	4.16	0.38	2	6
Teacher # 30	4.16	0.65	1	6
Teacher # 31	4.04	0.79	2	6

Appendix I

Table 11

Frequency Distribution of Participant CFT Index Survey Responses

Item	*N=20*	*6*	*5*	*4*	*3*	*2*	*1*	*Total*
Teacher # 1		10	16	18	1	0	0	45
Teacher # 3		0	15	23	6	1	0	45
Teacher # 4		6	22	11	5	1	0	45
Teacher # 5		0	12	30	2	1	0	45
Teacher # 6		10	14	7	12	1	1	45
Teacher # 7		12	24	6	2	1	0	45
Teacher # 8		7	16	16	5	0	0	45
Teacher # 10		9	16	12	7	1	0	45
Teacher # 11		30	13	2	0	0	0	45
Teacher # 12		40	2	3	0	0	0	45
Teacher # 13		19	14	5	4	2	1	45
Teacher # 14		27	14	3	1	0	0	45
Teacher # 18		14	21	7	3	0	0	45
Teacher # 19		4	14	14	6	7	0	45
Teacher # 20		4	17	12	7	4	1	45
Teacher # 22		16	19	10	0	0	0	45
Teacher # 25		7	25	9	4	0	0	45
Teacher # 29		16	16	7	4	2	0	45
Teacher # 30		3	13	21	6	1	1	45
Teacher # 31		6	19	15	4	1	0	45

Appendix J

Teacher Survey Results Letter

Dear

Thank you for completing the teacher survey! I've been commuting to William and Mary from Midlothian for my doctoral classes since May of 2003, so my thanks to you for helping me complete my degree is very sincere.

The quantitative results of your teacher survey fell in to the specific range that my dissertation study is examining. Therefore, I'm emailing to ask for your further assistance with my study. Would you please complete a short interview by email, phone, or face to face? I've attached the study questions for your perusal. I am happy to accommodate whichever format you feel would be easiest for you.

I'd also like to perform two brief observations in your classroom. These observations would last for only 60 minutes each and I'd need to complete one in the winter and one in the spring. They could be scheduled on mutually convenient dates.

I know observations make some teachers feel uneasy. I am not observing teachers to judge them, but rather am examining what actually happens in 9th or 10th grade classrooms in the current No Child Left Behind era. No one at either William and Mary or [your high school] will see my observation notes, and they will be destroyed when the study is completed in April 2008. Both the interviews and observations will be reported in my dissertation in unidentifiable, aggregated form

I understand that you are busy and that I am asking you to sacrifice some of your valuable time. Thank you for your willingness to help me further!

Please email me with any questions or concerns.

Matt

Appendix K

Teacher Interview Transcripts

Teacher 7

1. How do you think the American public defines creativity? I think the American public defines creativity in different ways; in part through self expression...music, art, theatre, but also by how one goes about succeeding at various endeavors.

2. How do you personally define creativity in students as demonstrated in classrooms? I define student creativity as being able to express one's views through various means, even, and perhaps especially, when there are strict guidelines that must be followed.

3. What are some individual characteristics of teachers considered to foster creativity? Individual characteristics that foster creativity include energy, open-mindedness, and a willingness to allow students to present abstract and unconventional points of view.

4. What strategies do you use to foster student creativity? Why? I try to be as creative as possible myself in coming up with activities for them to do because it will help the students want to put themselves in the projects as well. Although I often give specific and strict guidelines for student activities, I also leave the students room to put their own "flavor" into whatever they're doing. I encourage it because I had many teachers who stifled my creativity and I lost out to having my views analyzed and presented along with losing the opportunity to hear the same for my peers' ideas.

5. What is the relationship between creativity and learning in the classroom? One is synonymous with the other. Students are so desensitized today by everything

they see on TV and through video games. They're attention spans are microscopic, and there must be a high level of creativity, inventiveness, and flexibility on the teacher's part in order to reach the students.

6. What do you believe American school systems can do to enhance the fostering of creativity? One thing that could be done is to minimize the focus on standardizing everything about education. Students don't come to the schools standardized, and while there are some skills that all students must know, the way those skills are presented and how their mastery is evaluated does not have to be the same across the board. An 11th grade student who moves from a 5th grade reading level to an 8th grade reading level should be praised and evaluated according to his/her achievements and capabilities, not demoralized and constrained by being compared to everyone whose capabilities are vastly different from his/her own.

7. Why do you believe that creativity should be fostered in k-12 students? Creativity should be fostered in K-12 students because, the way that our society is now demands it. There are so many new fields opening up, especially in regard to technology, that today's student needs to be capable and to stand out among all the other people who can perform the status quo without stretching beyond it.

8. What is the relationship between your past experiences and creativity? To some degree, my levels of creativity are borne of obstinacy. I had many teachers who encouraged my creativity, but they didn't impact me as strongly as those teachers who tried to suppress it. In allowing creativity, I was able to make mistakes and discoveries at an equal rate, thereby enhancing my overall knowledge.

9. What factors facilitate your ability to foster creativity? In your classroom? In your school? Although space is limited in my classroom, it is in some ways good for the students to have to work closely together. The lack of space allows for lots of group work and the chance to consult other minds on a topic. There are several resources to help foster student creativity in the school, some of them including the media center staff and other teachers teaching the same or a relative subject. Drawing from other people experiences always allows for one's mind to expand, whether one is 14 or 44.

Teacher 11

1. **How do you think the American public defines creativity?** The American public in general, when you are talking about someone who is creative, they see them something other than normal. My grandson is very creative and he's also very ADHD too. But he is viewed by his mom, my daughter, as being kind of out here, somewhere. My other grandson is not creative and he is very normal and I think sometimes educators, if they're not in the arts, view the kid who is, as some them call, 'drama geek'. They don't view them being the mainstream. My opinion.

2. **How do you personally define creativity in students as demonstrated in classrooms?** A student is very creative when they take an assignment beyond the limits of what I would expect. Last year I gave an assignment to, I mainly teach C level students which are the average students, and we were working on Columbus and John Smith, because I was teaching American Lit. I asked them to make a journal entry from either of them, and I gave them a little of the back ground. I had about 3 students out of 30 in one class, they browned and burnt the papers around the edges.

All I was asking for was a journal entry but here were students going the extra mile to make it look authentic, to look like it really was. To me that was creativity. Not just handing me a journal entry but trying to make it almost a piece of art work even though they were trying to put it in the particular time period and make it look like it was a piece that had survived all these years. To me that's creativity. If they are given an assignment, they go beyond the assignment. I don't see that a lot teaching C level kids. I don't know whether it's because they are beaten down by the system, unmotivated by the system, but it was actually very refreshing last year when that happened.

3. **What are some individual characteristics of teachers considered to foster creativity?** Very open minded. They are generally young. They have a certain creative side to themselves. They haven't been beaten down by the system. They are going to do everything in their power as a classroom teacher to draw out creativity in their students. They are not like me; they're not shocked when it happens.

4. **What strategies do you use to foster student creativity?** When they are doing an assignment, if they go outside of the boundaries, I praise them for it. Sometimes I actually put the work up. I share the example with the class as being something that I really like. I'll give extra credit to the students for going that extra mile for really thinking it through not just handing me something that covers the assignment. **Why do you do this?** Because I think that creativity should be rewarded. I can understand when they are doing an SOL or some state mandated test why they don't and I tell them before we are going to take this sort of test, "Let's not be creative here because this is not what they are looking for, they are looking for whether or not you

understand the basics, now, certainly with an SOL writing test you can make up a story, but you got to stay within the parameters that you have been taught."

5. **What is the relationship between creativity and learning in the classroom?** I think it helps. I think when the student can take an assignment that extra mile, or that extra foot, I think they are getting more from it because they got to understand it in order to be creative about it.

6. **What do you believe American school systems can do to enhance the fostering of creativity?** Teachers have got to get away from the, setting the standard as Honors and wanting to do only for the Honors kids, because even my students, and of course I teach the Johns Hopkins program, they can be creative when they want to be, but for some of them all they are going to do is get out of high school. Some teachers, I see level kids because, as the reading specialist I get to see other classrooms, they get them to draw something and they put it up on the board. Some of its very good and some of its not so good. Everyone wants to teach the Honors. Everyone wants to teach the kids going to UVA, JMU, Harvard, and Stanford and that's not the majority of our kids. The majority of our kids are the Average Joes and sometimes these Average Joes will surprise you in their successes and what they choose to do and sometimes the don't do it until after they get out of this mold that a lot of high schools set up. "Well, you are a success because you are going to college and you have a high SAT score". Well, some of these kids lead miserable lives, they would very much be better if they were, (office announcement over the PA system) I see it among my colleagues that the kid that wants to make good grades and wants to go to one of these schools, that's where the time is devoted. The others need a chance to. They do.

Can you give me a brief example of an experience that you had with a student that wasn't Honors that garnered some success that you saw that other teachers don't see? The first year I taught American Lit was 16 years ago. Previous to that I was the reading specialist. I love the Civil War and Herman Melville wrote Civil War poems and I liked them a lot, so we were going to do Civil War poems. We read them because I didn't want to drag C level students through *Moby Dick.* It wasn't going to happen. The next year, this young man was a senior, and he wrote a letter to me that he had been accepted to Mary Washington College. He was majoring in English. He said the reason he made that decision was because of Melville's Civil War poems. He said "You turned me on to English and writing. That's my major". Every year for the next 14 years we read Melville's Civil War poems. Not that any one else would have been turned on to it, but he was a C level student, but all of a sudden, these Civil War poems made a difference with this young man. It's quite a coupe to get into Mary Washington College as English major. That's my little thing for creativity.

7. **Why do you believe that creativity should be fostered in k-12 students?** I think our students will realize what they want out of life and if creativity isn't put down, or isn't stigmatized, we will have a happier school population. Creativity isn't the kid who does paintings that win prizes. It's the whole spectrum. Okay, so he's not a great painter in the 8th grade, but who's to say that he won't be a great painter in the 10th or 11th grade. If we say "You're doing it wrong", we're squelching that. We are telling this kid that he's not good enough. We really are.

8. **What is the relationship between your past experiences and creativity?** I was squelched, not that I'm not creative. I guess in elementary school, of course this was

many years ago, only the best were pushed on. If you weren't the best no provisions were made for you. And I wasn't the best. Only the A students got to do the bulletin boards, and I wasn't an A student. Only the A students were chosen for committees, had their drawings put up, or knew enough about music to be encouraged to take music. So, I was squelched.

9. **What factors facilitate your ability to foster creativity? In your classroom? In your school?** I want to see these kids go as far as they can, to be all that they can be. I'm going to encourage it. Thank goodness I don't have an SOL this year with these kids. When I was in 6th grade, I was provisionally placed in 6th grade. I'm going to get emotional about this. I had a teacher named Eleanor Farley and she took me under her wing. She made me feel like I could do it. She's why I became a teacher. She made me on a committee. We were doing a European Fair, and she put me in charge of Spain and we made a poster and we talked about Spain and this was the first time anybody had ever reached out to me and said "You can do it". So, I teach special-needs kids. I teach kids this reading program. It's why I do what I do. I didn't think I was going to cry during this interview. I was 11 and I'm 62 now. She was wonderful. She was in an accident when she was 16, something involving gasoline. She lost her left arm up to her elbow. She lost her thumb and her fingers were burned. She held the chalk in between these two fingers and that's the way she wrote. She had beautiful handwriting. I don't know whatever happened to her but I'm here because of her. I bet I'm one of the only ones that have cried during the interview. **So far.**

Are their administrative factors that help you facilitate creativity? [The principal] is wonderful. She moved me back in to the position of reading specialist this year.

No one observes me. I am supposed to help these kids get back on track, or diagnose any reading problem they have. She's allowed me to be as creative as I can be in this program. My county supervisor wants me to stick to the model and I do understand that when these children know what's going to happen each day, they know that they are going to do Showcase, they know they are going to work with a partner as far as reading is concerned. Right now we are doing make up work so they can pass, but he himself is very structured. Between the two of them, I know I've got to do it his way but she allows me so much leeway that I think that pretty much if they ever decided to be creative it could happen because she's not so driven that, "Yes I'm going to follow the model." It's like a basal reader. They tell you when to sit down, when to stand up and when to spit. But she's the reason I can do what I do with these kids. I hope their reading scores come up. When they came in here a lot of them didn't care about grades or about school, and most of them do now and I think it's because of the leeway that she allows me coupled with the structure of the program. **Okay. Thank you. I'll stop the recording now.**

Teacher 22

1. How do you think the American public defines creativity? I think they tend to look at creativity from an art standpoint…the fine arts, music, paintings, that sort of thing, or in a limited way. I think it's changing around some to looking at people or things with better creativity and engineering, but looking for new ideas or whatever. But it's usually in the flashy type of something. They don't think of something like the flood gates across the Thames, they don't think of that as being creative.

2. How do you personally define creativity in students as demonstrated in classrooms? Anytime they come up with something that is a link, then they make something that is an intellectual leap between what we are talking about to something in their life or something they've seen or even between just two different subjects where they've gotten into…say we are talking about rivers, for instance, in class, and they link that over to some bit of literature that they've talked about where a river was involved, or anything where they show me that they're thinking the next step up instead of "Just tell me what I need to know so I can pass the quiz"…something that shows me that they have gotten things in to their head somehow.

3. What are some individual characteristics of teachers considered to foster creativity? I think anytime we can get together and come up with something that is going to catch the kids' minds as far as where their brains are running off to at the moment and can bring that in to the classroom or the teachers that can be animated and draw the kids' attention in some way. I think that helps to bring out the creativity. Or even those of us that aren't as theatrical if they can just praise the kids even if they come up with some sort of off the wall thing, if it's somehow linked in just give them praise for some idea that they come up with. I think that helps.

4. What strategies do you use to foster student creativity? Why? What I'll typically do since we have so much of the work in science that's putting pencil to paper and writing things out, in Physics I'll have them do presentations where the kids go in and they pull out what they think is interesting and they present that to the rest of the class. In Earth Science, I've started having them do illustrations of what we are doing in class, and showing their view of what we are in to. Lately I've had an

entire assignment in class, instead of having them write out all these little facts about the atmosphere, I've had them do an illustration of pulling all they knew about the atmosphere in to a drawing with the facts worked in to it.

5. What is the relationship between creativity and learning in the classroom? I think when the kids get to the point where, especially with sciences, obviously art and music, there's a lot of creativity. There are some basics they learn and then they take off. I think within Earth Science, if they can make the leap between learning facts and pulling it together in some sort of illustration or just mentally make a leap between different things. Earthquakes aren't just something we talk about in class. It's like, "These things happen in the real world." To make any sort of link that way, I'd consider that to be the beginnings of their creativity. And even when they start linking between the different topics, say, within our science, we cover four different topics. I'm trying to get them to pull it all together, so it's "It's all one earth here, guys. These aren't separate things you keep in different boxes." Anything along that line that pulls that together.

6. What do you believe American school systems can do to enhance the fostering of creativity? I think if we get in to, I know it's tough to do, to bring different departments together and get them to have cross talk, things we can do together with joint projects. I think it's easier at the, especially at the elementary level where you've got one teacher teaching multiple subjects or even in middle school where you might have some...middle school I'm a little weak on. My kids haven't gone through that, and I don't have any family that teaches middle school. It's easier in elementary school where they've got one or two teachers and they pull it all together, and can

bring disciplines together that way and I'd like to see a bit more of that at the high school level. I know there's effort in that direction, but it's just hard to do with the time we've got. I think just getting cross-discipline projects together so the students don't look at us and, "Well, English is completely separate from my science class. And why do I have to spell in science class? And why do I need to write well in science? Or why do I have to write well in social studies?" It's like, "Guys, you still need to express your ideas." And it's like, "Why do I have to write about science in English class?" And I'm like, "Well..." We are even pulling art together with science and then writing about English and bringing these topics up and up again in their brains. The kicker is getting us all together to have the time to work on that. That's painful. I know myself I've got a folder this thick, about five or six pounds of paper that needs to be graded. It's like, "Oh, yeah, I'll do that in my *spare* time." That is one thing we've talked about for next year. The small group that I'm working with in High Schools That Work, permitting connections between departments. And we are talking about having, at least, pieces of departments having common planning time. So that within the department we can plan together. And then, in theory, that will give us time to get together with other departments on smaller time frames and we can talk about what we can do together. We've got ideas here, we just need to see if they will work.

7. Why do you believe that creativity should be fostered in k-12 students? For one, I've taken the education classes and I've seen it in my own kids as well, is that the more they get to use the little facts that they're soaking up in elementary school and use that in different ways the more they are going to learn it, and the more they

are going to make connections, just getting down to the research on brain activity: the more you use the information the more you make connections and you get better development of the brain as a whole physically your making those connections between different subjects and different topics in the brain and that stays with them. In my personal life, I'll get into everything. I'll sit down and watch, of course I'm a little more science biased, but I think it's just cool to see this thing is...there's a new pigment in art or whatever, and then seeing the science behind that and why it's such a good pigment in art and linking that back, or to see some new product and going back to see the engineering behind it, or, of course, my favorite thing is, when the original Start Trek started, I got to see some of the original episodes and then reruns forever, growing up, and to see all the little things that came out of Star Trek that were just some science fiction writer's idea and now because the engineers thought that was a cool thing, they made the technology happen based on their creativity. So the next thing I am waiting for is the little communicator pin and the transporter to send me from home to school. Getting that sort of creativity...of course, I just appreciate seeing artwork where they've blended the colors, since I'm from the science geeky way I can appreciate it for its art sake and then go "Well, how did they do that?" and I get in to how they actually did it. And I think that, even the folks in art, if they had a better feel for the science behind how the pigments work, and I'd have to talk to an art teacher to tell how much of that they get in to themselves because that could make them even better artists because they could understand better how the chemicals are doing, how the paints are going to physically adhere to each other as opposed to, "Well, my art teacher told me to this is how this works." If they

know, "It's going to work if I do this." If they know how it's going to work, then that gives them the next step up into moving on with the art at a better pace because if you have an intellectual idea of what's behind what's working then you don't have to do a trial and error like Thomas Edison. "Well, we'll add this little thing and we'll try it a thousand times..." You don't have that pain of going through so much trial and error. You can just go, "Well, I think, based on this theory and how I was told this works, that if I try this, this should work." And you might get four or five trials of something before it works instead of five hundred trials of something.

8. What is the relationship between your past experiences and creativity? My past experiences, I've always loved, as far as what's actually in school, I think when I was going through school, a lot of creativity was in the little boxes. Where I got an appreciation for pulling the creativity together is basically kind of left over from my parents. They are very much into the idea of a well educated, well rounded person so that meant that you didn't just focus in tight on this subject and ignore the rest of the world. As a matter of fact, my dad, who went through engineering, resented the fact, to some extent, that his curriculum in college was so narrowly focused. There were so many classes that were just engineering and science, that he's actually gone back, he's 75 this year, and he's taking a seven course load at the University of Delaware through their Extended Learning Program where, basically, senior citizens can take classes for two hundred dollars a semester. He's taking all these other classes. He's taking Spanish. He went to El Salvador to teach for six months on a Fulbright scholarship, so he's fluent in Spanish. His first language is German since his parent came from Germany in '27 and '28. His sisters had to teach him English before he

went to kindergarten. He's taking classes on the politics of South America and photography. He listed off the classes, but he's basically going back and filling in all of these liberal arts classes. He's already finished one master's in Liberal Arts five years ago, so he's going back and taking more beyond that. I haven't gotten to liberal arts because I'm still focusing on all the little science things that I like to take. I've got my bachelor's in Physics and my master's in Electrical Engineering and I'm now working on a master's in Teaching Geo Sciences which includes meteorology, astronomy, geology and oceanography. So I'll have those added. And it's mostly I'm taking it because I like these subjects. It's like, "I want to know more about these." But I've also enjoyed sitting down with art things. And if I had time I would sit and do artsy types of crafts for the classroom like sewing. But there's always been the encouragement to learn about all sorts of things. But I haven't had as much appreciation for English class. I think that's more of the fault of my later high school English teachers that weren't all that exciting themselves, but that's another story. It took me years to learn how to write a proper essay because we talked our 11th and 12th grade English teachers out of writing essays which was a mistake, but you don't know that during high school. But know I do things like a role playing game where I keep a diary of the characters in the game. One of the diaries for one of the characters ended up being over six hundred text pages long, single spaced. So, the creativity has branched every which way. If I could get away with less sleep, I'd do it.

9. What factors facilitate your ability to foster creativity? In your classroom? In your school? The staff is really good here. I wish, if I had another planning period, I'd be hunting more people down. Because you go to just about anybody, and unless

their in the middle of a crunch…don't go near them during exam time, or at least not before exam time, to try and get people's time. If you can actually get a chance to get together with some folks they are more than happy to help you with stuff to bring ideas together. We are pretty good at getting supplies for things as far as art paper and stuff, they're kept in the library. If I think of some clever idea that involves art paper there's three foot wide paper available. I've collected crayons and colored pencils. Just inviting the kids to come and have their own ideas. (The principal) is fairly open with just about any idea we come up with. We have to make sure the kids outline what they are going to use first because we have to make sure that nothing is on the 'do not bring to school' controlled list. Like I said, if I had more time…there are all sorts of neat things that (the principal) sends out for grants that I haven't even had the brain time to just sit and say, "That looks like a neat grant", but this is my first year of teaching Earth Science. It's amazing how much time the freshman eat up. You give the seniors something, and they might goof off a little, but they don't need the constant "Sit. Sit. Sit." You don't have to train them to stay still. I can give the seniors bigger projects and have them work on it on their own for a while but the freshmen require, "Here's you 5 minute baby step. Here's your next 5 minute baby step. Did you do the last 5 minute baby step?" So, if I had a little bit more time this year I'd be digging in to those grants in the classroom. We got new textbooks, and we received all kinds of new resources that go with them. I've got a test generator, a set of PowerPoint slides that came with the textbook, and many sets of different workbooks. Even though I am using the resources less that they gave us, they still are the jumping off point for the stuff that I want to do. It's kind of like educating the

kids: You give them a base, and then you get the creativity from there. It gives them a starting point. If I didn't have that base, I'd still be making up the basic stuff and not have the chance to go up a level from that and use some of my own creativity to figure out stuff from there.

The time theme was acknowledged by you in many of your answers. So time is one of the things you need to keep in mind when trying to be creative? Right. There are some things that, it's just a matter of, I know I can't get away from grading my own papers, but it makes me nuts when I have to sit there and make three bazillion copies of things. It's like, "Please, can we get someone to do copies." Or, I think the least favorite duty for this year has been sitting guard at the front door. It's like, you've got all of these people that have all of this education, they're encouraging us to get Nationally Board Certified, and teacher salaries aren't the greatest in the world, but it's better than what you'd pay a rent-a-cop to sit at the door. But you are using the time of these highly educated people to sit and sign people in at the front door all day long. And that just eats up time. I'm lucky in that the duty I have is...we've got a teacher in from the (Community College) who can only be here on Monday, Wednesday, and Friday, first block. So I share the duty of watching those students on Tuesdays and Thursday with another teacher. The lucky part about that is, I take roll, and I sit down and do grades, so I don't feel like I'm wasting time whereas some of the other duties... Also, standing at the copier machine, if I could get back the hours I've spent standing at the copier machine... I can easily, per chapter, spend an hour and a half at the copier, putting things together just for the students to have, just for science. We've got these little cards for the copy machine that adds up the

copies, and one the one machine I have about 45,000 copies on one machine. I think that's spread over two years. Eating up time with things like that. And if we could get anything to have the chance to work on our own and coordinate schedules to work with others. **Okay. I'll go ahead and stop the recorder.**

Teacher 13

1. How do you think the American public defines creativity? Anything that's different than the norm …whether kids discover ways to do things to get the same goal, but different means to get there. So it would be like using, in honors, Multiple Intelligences. It's not just learning by doing, learn by seeing, or learn by hearing. I think it's allowing students numerous ways to get to a specific goal, to be creative.

2. How do you personally define creativity in students as demonstrated in classrooms? The same thing, you're limited because there are so many students in the classroom, you try to diversify by having video, hands on, visually…recently I had a kid say he doesn't read well for notes. I asked him if he understood me when I said it, and he said "No", so he has limited options. But you're not doing but doing, or you're not doing it by seeing or hearing. It makes you think, "What's left?" And because if you've got 30 kids in a class, you may be doing the projects or lessons in three different ways. It's like having segments of that unit done in numerous ways. So if you are only doing it one way, you've got visual, you've got notes, so if the students are stronger in one than the other one, so you can give the goals in different ways. Try to help all students, but the problem is timing. I think that helps.

3. What are some individual characteristics of teachers considered to foster creativity? Being open-minded, being flexible, going to conferences and trying to

discover new ways to do things I wish I knew more about it. Often, you get these educational magazines that you can recycle. There are, sometimes, good things in there. Asking another teacher, reaching out. But I found that teachers that are miserable that aren't open to any suggestions, then they are miserable in anything they do. When students say that, well, this teacher is one-sided, I say they shouldn't be teaching in the first place, and they'd probably be one-sided or have the same viewpoint no matter what they do. I don't understand it. You have to be open minded. You have to admit if you're wrong or if something is not working, you have to change it. Just scrap it if it is something that hasn't worked out. Admit that you're wrong.

4. What strategies do you use to foster student creativity? Why? The same thing. I don't do projects, but if you're doing a lesson try to look at it in different ways of doing this. I had the students watch a documentary and then try to write an essay about how the director was viewing it. "Why did he view certain people doing certain things during the revolution?" It was a bad video, but it was good in terms of getting them to think. No one would view it as, "This is terrible." But if you looked at it in a different way and say, "Why did he portray the people in the different ways that he did?" I'm really surprised because the essays I am getting back are actually very good. Because I said "Why do they show it this way?" and they said "They show it this way because they wanted you to see certain groups portrayed this way." But the end result, without the SOLs I would definitely do it. And I've talked the last three years about having them do stuff like this, have them do their own video, have them do it after SOLs have them compile stuff and say, "Okay, you're going to do unit on

Industrial revolution, you're going to do French Rev. How would you make a 5 minute video?" It can let them be creative that way, and I let them do sock puppets one year and it was great for absolutism, but it just took forever. It was great, the kids were really creative about it, you have such limited means to get your point across because of SOLs. I was bitter about it, coming out of grad school, but then I got over it, and now I'm bitter again. There is so much there that they could do, and I have to look to other teachers to see how they are doing things, and the problem with projects I think is that it takes so much effort on the students and teachers. "Okay, we are doing this outside of class; you have to have the means of doing it, computer or whatever. You could be musically inclined or whatever you do." I did the rap songs last year, but you can't discriminate against one kid because they don't have the means to do as well as another kid, because they don't have the money to do it. So that's the problem I find with projects. With projects, I'd have kids say, even when we did a brochure for Islam, you know, something creative like that, advertising Islam, saying what it's about. The kids asked if they could go home and use the computer, and I said I want you to be creative in the classroom. The computers here are slow, and if the kids do it at home, it keeps away the "Your pictures are better than mine." But it asks the question, "Are you really thinking when you're downloading a picture?" but when you draw something I think it comes across better. I think that when you write something on a paper or draw something it sinks in better than in you print something off and hand it in. It's always a constant battle.

5. What is the relationship between creativity and learning in the classroom? The same thing. They are part and parcel of the same thing. The traditional setting is out

the window, of just lecturing and having the students writing down notes. There are other ways to do it. I tell my kids that they have to read, and they just don't read, and it just puts it into context. If you just don't read, and are just taking notes, you are not going to be able to understand what I am saying or what's up on the board either. I have to come across in certain ways, and if they're doing things, and they're not getting what I'm getting, all these parts work together. They are all part of the cogs in the wheel, a part of the system. If one is weak, then the other will not pick it up. I don't think kids understand that. A lot of kids say they are studying, but are they really studying? There's a certain way to study. It's an active process. You have to write things down. You can do flashcards. You can have someone verbally give them to you. There are different means by which they can get things, but I have to be creative. They have to be creative, too, and as open-minded, just like I am. They have to say, "Look, this isn't working. Maybe I can do something else to understand it." It's kind of aggravating from my end. The kids need to be open minded in terms of how they learn. Their study habits just aren't there. I don't know why kids aren't getting study skills. It's a constant battle. It's not hard.

6. What do you believe American school systems can do to enhance the fostering of creativity? Get rid of SOLs and get qualified teachers. You could get qualified teachers who can say "We know what we are doing, then just let us go". The older teacher, I know it's the generation, but I'm surprised at the way that some older teachers are really open to change and the way things are run. You're playing a system here. The SOLs just tie you down. Life is not a multiple choice test. No one is going to ask you, "Hey, do you know where France is?" "What are my options?" It's

just something that you need to know. It's mind-boggling and it makes you think when you don't have the multiple choice there. I think writing SOLs are fine, but it's too constrictive. There are too many things on the SOL that shouldn't be there. It's not going to impact their lives. They don't go hand-in-hand. I think principals have a lot to do, it's a top-down thing, when they have to encourage people to go out to other teachers, go to workshops and foot the bill for that. In the past, I have had to pay for my own conferences to go to which is nuts. If you want qualified teachers, one of the perks should be to go out and try to learn. Sometimes the principal or the county won't allow you to do that since the funding is not there, or they don't want you to leave the building. That's not good for being creative. Also, asking the students what works and what doesn't. One thing I just read about ADD, is having the students own the problem. You know, "What do you think might work for you?" Not really giving them an answer, but making them say what would work for you in the classroom and having them come to a decision as opposed to someone telling them what to do and then they own this. Studies have shown that this actually helps because they come up with their own solution. And it's not just one solution, it's just that we have to stop dictating if we want kids to become more independent. It's hard to do. It takes a lot of patience on the part of the teacher waiting for the answer to come in instead of just jumping in. It's mind-boggling to me to think that kids have never been asked to respond. We don't listen to their answers, you know?

7. Why do you believe that creativity should be fostered in k-12 students?

Because students learn in different ways. Because America is very creative in business practices and that's been our strength and I think that's..., the schools and

creativity just doesn't work. And there a lot of kids who shouldn't be here. They should be taking online classes. When you hold them in this institutionalized setting, this factory setting. The dynamics of the business place have changed and we have to work with the students, we have to go with the flow. That's the biggest angle that politicians should take. But it also takes money, because if you're pushing for computers in the classroom, they have to work, and a lot of websites can't be blocked, and we have to get the proper training on that. But if kids are good at this, then let them go with that let them do what they can do and we can tell them what the parameters are, but we need to be flexible in that. More people should listen to what the academic people are saying. But the thing is, you get information overload that you don't know what's fact or fiction and you hear what's on the radio. It's very frustrating.

8. What is the relationship between your past experiences and creativity? Reality sets in. I had a lot of education classes and its like "Yeah, this is great!", then you get in the classroom, and your like, this doesn't work. It takes a few years to figure out what works and what doesn't. I have to constantly go back and say, Bob, across the hall, the new teacher, he's got new ideas I've forgotten about. And now is the time I need to try this. During the first few years, you want to try to get to the content, you try something out and that doesn't work, but now maybe that something may work. You can probably go back and implement those simple things in the classroom since you have that foundation that you need right now. We get caught up in our rote way of doing things. That's bad to take the easy way out. Especially for someone that coaches, or has to be somewhere after school, It's like "Okay, we'll just do this

tomorrow." This is not good. You need to diversify. I know I have to do a lot more of that. We are worried about the SOLs. Just the pacing is such that it is just too much. You have to hit the road running and say, "Okay, we got to get through this." It's reality. You got a deadline to meet. And you have to prepare them for this, and if you're not doing this, then that's a problem. I have an obligation to teach them the SOLs, too.

9. What factors facilitate your ability to foster creativity? In your classroom? In your school? The principal, to give funding, making us aware of what's out there, having people come in for in-service. I go back to the stuff I have in in-service and pull it out to see if it will work. Talking to other teachers, you know, breaking down the walls per se, and try to reach across, within the school, and hopefully, next year, with working across the curriculum, trying to see how to incorporate science more in to the classroom. The person we just hired for overcrowding, I think that she's got some math and history, her focus is working with science and history. We are aligning English and history next year. Hopefully that will work to give us more creativity. The thing is, the nay-sayers, the ones that don't want to do this thing, if it's working, then maybe they will want to come along, or come around. Most of the time I feel like I am fighting the system, or fighting the others who are not teaching writing. I'm like, how can you not know that? I don't want to be self-righteous, but reading is so important. It gets the students to think. And I am so amazed, especially during the extra SOL class that I teach after school, you get kind of jaded. I know that they learned it, but I'm like, "Where did it go?" I don't know if it's DVDs or CDs. I know these kids are creative. They're obviously doing something right,

because I know that they are getting computer jobs. Maybe it's our problem. I don't know. Maybe I should be on the couch. **Okay. Thanks. I'll turn off the recorder.**

Teacher 1

1. How do you think the American public defines creativity?

Performing or creating beyond the limits of what is considered "normal."

2. How do you personally define creativity in students as demonstrated in classrooms? Thought-provoking analyses of data and information, presenting new ideas not previously discussed.

3. What are some individual characteristics of teachers considered to foster creativity? Open-minded, enthusiastic, creating a creative environment, supporting concepts by using recollections of known experiences

4. What strategies do you use to foster student creativity? Why? Applying multidisciplinary concepts to subject matter, hands-on learning, i.e. model making, "arm-waving," diagrams, data analysis, generation of hypotheses.

5. What is the relationship between creativity and learning in the classroom? Students are able to tie known information with unknown concepts. Students can apply concepts during hands-on activities.

6. What do you believe American school systems can do to enhance the fostering of creativity? Teachers are on such a schedule to present all the information necessary for students to pass the Virginia SOL. Sometimes outside interests are not afforded the time because of the schedule.

7. Why do you believe that creativity should be fostered in k-12 students?

Students will tap into their interests when able to be creative while solving problems and/or answering questions.

8. What is the relationship between your past experiences and creativity? Some of my best work has been due to my ability to generate creative visuals such as subsurface maps to aid in the analysis of data to support a conclusion.

9. What factors facilitate your ability to foster creativity? In your classroom? In your school? I am able to foster creativity when I have the supplies, equipment, permission and support to perform at times "outside of the box." I have been awarded with grant money to take my students out of the school and sample water from the Swift Creek Reservoir. This is a creative way to study the impact of human development on our local drinking water supply.

Teacher 14

1. How do you think the American public defines creativity? Creativity is the ability to think outside the norm. This creativity is only recognized when it can be translated into some kind of tangible product. Otherwise, a creative thinker might simply be recognized as "strange."

2. How do you personally define creativity in students as demonstrated in classrooms? I think my definition is similar; however, thinking freely and being able to express those thought in discussion is enough. While I do teach the skills it takes to communicate creative thought to others (writing in many forms, etc.), I also appreciate free thought in the form before it is manifested into something tangible. (It's 7am – I hope this is making sense)

3. What are some individual characteristics of teachers considered to foster creativity? Creative themselves, open-minded, free-thinking, nurturing, accepting

4. What strategies do you use to foster student creativity? Why? I am an avid proponent of discussion and Socratic seminars. In these settings, students are encouraged to express any idea as long as they can support what they say with some kind of evidence. I also use journaling as an opportunity for students to get out ideas without being preoccupied with usage and grammar requirements. I have students respond to visual art (paintings and film) in addition to written texts because it allows them to see that analysis of "art" is the same as analysis of "literature" because despite their prior ideas, literature is a creative art.

5. What is the relationship between creativity and learning in the classroom? Creativity drives learning. If a student can think for themselves – that is, in whatever unique way they think – they are more apt to learn from whatever they are doing. In most cases, students don't need to learn how to be creative, they just need to discover their own creativity, and it is this discovery that, hopefully, leads them to enjoy learning.

6. What do you believe American school systems can do to enhance the fostering of creativity? I think the school system can, at times, be too regimented and, for lack of a less severe term, militaristic in its rules and discipline measures. When students are told "no" all day long, it hinders their ability to want to think. Instead, they view school as a sort of prison – both physically and mentally. I am not sure that the "sit in your seat and be quiet" approach to school fosters creativity. However, there has to be

some kind of order before learning can take place, so I have not exactly mastered a plan for an alternative.

7. Why do you believe that creativity should be fostered in k-12 students? See answer to #5. ☺ Creativity provides students with ownership over their own learning by allowing them to think in a way that makes sense to them.

8. What is the relationship between your past experiences and creativity? I floundered in Math and Science because very little creativity was involved in those subjects. It was not until I had a teacher who seemed to value what I had to say that I even became interested in my English classes. It was actually that teacher, who welcomed creative thinking, who inspired me to be an English teacher.

9. What factors facilitate your ability to foster creativity? In your classroom? In your school? I try to make it clear to my students that I want them to bring their own ideas to whatever we are doing. I also try to incorporate creative activities into each day so that the environment itself inspires the students.

Teacher 18

1. How do you think the American public defines creativity? The American public defines creativity in the sense of arts and entertainment. When the public thinks of something as "creative," they are using it as a descriptor for art, literature or music, and not necessarily considering it in all the realms in which it can live.

2. How do you personally define creativity in students as demonstrated in classrooms? Students can be creative in the traditional sense of physically creating something, or they can be creative in their thinking. I appreciate students who can take a concept and express it in a creative way, i.e. Putting a concept into art, linking

a concept to another verbally or in writing, or simply applying an abstract concept to everyday living. All of these are creative expressions.

3. What are some individual characteristics of teachers considered to foster creativity? Teachers who foster creativity cannot be defined in specific terms. They are all teachers who care for their students and try several approaches to achieve understanding. Creative teachers are those who put their students first and then decide how to teach a concept rather than falling back onto a routine. Creative teachers are those who are interested in their colleagues' techniques and routinely collect new information to improve their own theories and methods.

4. What strategies do you use to foster student creativity? Why? My strategies are defined by my students. I often rely on my own creativity to make a lesson more exciting to engage the students. I ask that students be creative in their writing and comprehension of concepts as well as some physical creativity. I often engage my students in book talks and have them create a physical representation of the book read. They enjoy the opportunity and tend to read more because of it.

5. What is the relationship between creativity and learning in the classroom? Time is a major problem in the classroom. I am required to meet certain goals due to standardized testing which often cut into the time needed to be creative. I have had to cut creative projects which were time consuming and fit creative learning and expression into a smaller time slot. Teachers can still be creative within a time limit, and goals are certainly positive, but the extreme limitation of the standards can be seen in the lack of creativity in many lessons.

6. What do you believe American school systems can do to enhance the fostering of creativity? This particular question is difficult due to national and state standards. Individual systems are governed by them and therefore must meet them. To foster creativity teachers must be encouraged, rather than barraged by statistics, data and test scores.

7. Why do you believe that creativity should be fostered in k-12 students? Creativity is a key to development. Creative people tend to be the most successful in life, and our job is to make them the very best that they can be.

8. What is the relationship between your past experiences and creativity? I have had to reevaluate creativity and its place in the classroom. My creative assignments have been altered to fit the pace of my classroom and state standards. Please note that the term "altered" was used rather than eliminated. It is still acceptable and expected to be creative in the classroom. I feel that I am actually more creative in my classroom and encourage more creativity from my students with the standards in place. Because of strict guidelines I have to use all of my creative resources to design lessons that allow the fastest route to comprehension of the lesson. For example, I used to have the class write their own odyssey after reading Homers *The Odyssey*. This would take up to four class periods with the planning and follow through of the assignment. I have now shortened it to fit one class period and have students work cooperatively. This allows not only for a faster product but also for students to band together and combine their creativity.

9. What factors facilitate your ability to foster creativity? In your classroom? In your school? As a school we are encouraged to work with other teachers outside of

our individual departments. By doing this we can be more creative because we know that concepts are being reinforced in others' classrooms. By working together we develop creative activities together and combine the time.

Teacher 12

1. How do you think the American public defines creativity?

2. How do you personally define creativity in students as demonstrated in classrooms?

3. What are some individual characteristics of teachers considered to foster creativity?

4. What strategies do you use to foster student creativity? Why?

5. What is the relationship between creativity and learning in the classroom?

6. What do you believe American school systems can do to enhance the fostering of creativity?

7. Why do you believe that creativity should be fostered in k-12 students?

8. What is the relationship between your past experiences and creativity?

9. What factors facilitate your ability to foster creativity? In your classroom? In your school?

Here are my responses to your interview questions.

The American public seems to get caught up in manifesting one's creativity by being different. If someone dresses differently, wears her hair differently, speaks differently, and so forth, our public seems to label that person as creative. I believe that our creative side can manifest itself physically in those areas, but our public seems to lose the point about individual thinking. I'm not sure I will stick to your

term of creativity. I am more comfortable using intellectual autonomy. I use this term extensively in my classes regardless if I am speaking to my 12th grade AP Language students or my 9th grade Mathematics and Science High School students. However, I encourage my students not to mistake intellectual autonomy for arrogance. We must check ourselves when we are engaged in intellectual endeavors so our peers and teachers recognize our sense of fair play. I encourage my students to listen to what each person has to say before making a claim and when the student contests or concedes a point, he/she must be able to restate what his/her peer has just said while substantiating his/her own claim. When I pose a question to the class, I try to phrase it in such a way that the students "open the door" for discussion and then I encourage them to "walk through that door." My analogies may not make sense until one witnesses what my students are capable of during a class discussion. My philosophy is to learn as much as I can from the students while they learn from me and their peers. I do not see myself as providing the answers for my students. They need to think about thinking. I encourage them to "slow down" their thinking before they speak. I use The Miniature Guide to Critical Thinking: Concepts and Tools with my freshmen after we have grounded ourselves with a piece of literature. We use a common text and then we move from basic recall to higher level thinking skills. I appreciate the latitude that I am given in my classroom and in the school. I have opportunities to create my own curriculum while incorporating texts that my Math/Sci students need to have in common with the comprehensive students by their senior year.

Teacher 25

1. How do you think the American public defines creativity?

I think that creativity is being able to come up with your own ideas or take an idea that someone else has made and make it your own and change it so that it makes it even better or looking at something and saying, "Wow! That would be cool. How can we make that work in this way?" or basically coming up with new ideas and using the imagination. And taking something that is either brand new or something that someone else has made and making it your own or making it so it works in a different way. That's how I think it would be.

2. How do you personally define creativity in students as demonstrated in classrooms? Asking questions, if we're going over a unit and they're asking questions, "What if we did it this way?" or "What if it went about this way?", or "What about this?", just really engaging themselves in to what is going on. For instance, I just did a unit on oceanography and my students had to create children's books on oceanography and they had to use the information that we learned in class correctly so they couldn't say "A surface current was a vortex of death". It had to be accurate. They came up with their own stories and a lot of them were extremely original. Awesome stories that literally could be published. But they took the information we had in class and portrayed it in a simpler form so they can make it in to a story. Some of them took a basic line of Spongebob Squarepants or *Finding Nemo* or Little Mermaid, and took those characters and made it into a different story, but a lot of them took their own characters and made up the stories themselves. That's what I've seen the kids asking questions, "What would happen if we went in to

space?" or "I think this would happen if we went into space". Using their imagination in engaging themselves with what we are going over that day, would probably be how I seen them doing creativity in the classroom.

3. What are some individual characteristics of teachers considered to foster creativity? Asking questions, not just giving an answer but using the Socratic methods, and forcing the kids to think for themselves, not just giving answers, allowing the students to talk to each other giving them open-ended questions, and just forcing them to think. Making things, making an environment that allows creativity as well, not just a drab environment giving the kids something to look at. With labs I try to allow the students to come up with their own procedures. "Here are the materials you're going to use, here's your purpose. Now come up with a way to find an answer to that question, to that purpose". "What are *you* going to do?" It's not just me giving them the answer I might come back and say "This is great, but let's think about this? Do you really want this at this point?" and asking questions so they can tweak the procedures to make it a little better than it was before. I think that teachers need to force questions on the students not just give them answers. That way we get students who can ask questions themselves. I think that's really important.

4. What strategies do you use to foster student creativity? Why? Using the Socratic Method, making open-ended labs so they have to figure out how procedures work themselves. If we get into discussions, and I love doing it, but I try not to because we are on a time limit because of SOLs. For instance, yesterday, we were talking about meteorology and we were talking about the different parts of the atmosphere and we get to the exosphere, which is the end of the atmosphere and we

start talking about space, the kids are *so* interested in space, so even though it wasn't directed to astronomy, I said, "You know what, we are going to go with the questions, I'll answer a little bit and make them abbreviated because we are going to come back to it later in the year." but I'm not going to stop their questions dead because they're like "Wow, that's really cool. I want to talk about that" and so I keep going with it. That way, they start thinking for themselves and thinking about different things. I like to do discussions. I like giving them little projects, like the books, so they can get creative with things. I have an Earth Science II class where they got to design earthquake resistant homes and they could do their own designs as long as they followed a certain criteria. That allowed them to do some pretty interesting things. Some of them really worked. It was really cool. Just having the discussions, questioning them instead of giving answers, having labs and projects that allow them to shine in different areas. With the oceanography books that we did, I had two students ask me if they could do a sign-along book instead of the colored picture book. I said, "That's great! Totally do that, but you have to turn in the colored book, too." They turned it in, brought in guitars, make a whole song to Johnny Cash's Ring of Fire. I try to look at students individually, at what they can do and allow them to do projects that will let them shine. If they are really artistic or musically talented that way, they can understand science better, because they are putting it in a form that they know.

Are the projects mostly made in the classroom or out? I try to do both. I try to do individual projects and group projects, and I also have individual components in the group projects. For instance, my upper-level Earth Science class, we are doing

geologic timeline that is on the ceiling in the hall way. That's obviously all in class. The oceanography books that we did were a combination of the two, some in class and some outside of class. It was a group project, it was pairs. Since they were freshman and a lot of the students lacked transportation, we had to do some work in the class as well.

5. What is the relationship between creativity and learning in the classroom? I think it's extremely important. I think to learn, you have to have creativity. It's one thing to be in a classroom and just get the information, the definitions, and the terms, but you're not really learning or understanding what it is. Where the creativity comes in to play it helps the students to really understand what they're learning, the definitions, the terms, the theories. If you don't have creativity, it's just kind of boring. Learning is not fun without creativity. It's not just the students that have to be creative; it's the teacher as well. If you're not, well, it's "Here's another class." It's not fun for anybody, for that matter. Teachers *have* to be creative. You never know what's going to happen in the classroom. You have to be flexible or creative and come up with something on the trend. A student can come up with a questions and your like, "Okay, we are going to go in a completely different direction now." They go hand in hand. If you don't have creativity, who wants to come to school without it?

6. What do you believe American school systems can do to enhance the fostering of creativity? Honestly? Get rid of the SOLs. I think the idea behind the SOL is really important. The student should have certain things that they need to know but it takes away from a lot of the things the teachers would like to do. To really make sure

that the students understand and know and are really engaged in the unit I know that for those of us who teach science find it difficult because we feel that we are just pounding the information in to the students and it leaves little time for the creative aspect. We don't have time to do as many labs as I would like to do because we have to move on because we have to get this much information in by May. It's very hard. Teachers have to be creative to figure out how we are going to get this lab and this information in and move on. It's hard. In discussions, there are times when I want to keep going with discussions because the students are really engaged and are really interested, but I say, "Guys, we really have to move on." It's hard because it is really cutting off their creativity. Cutting off what they want to talk about and want to learn. We have tests that we *have* to take at the end of the year. There are times when I say "Okay, we can't be creative part because you just need the information." That's just straight memorization. That's not good because they can't apply it later on. Creativity allows them to apply what they've learned. SOLs are definitely one of the biggest things that we need to get rid of or that or standardized test, either that or just move it back to later in the year, because the idea and theory behind it is really good.

7. Why do you believe that creativity should be fostered in k-12 students? It allows them to think for themselves. I feel that really creative people are those that have harnessed the way to be creative, just see the world in such a broader scope. They don't have tunnel vision; they don't see what is here in front of them at this point. It allows them to take different ideas from different places and see how they can come together. I find that my students tend to be a little more creative in the arts and music. They tend to be the ones that can see the broader spectrum of what's

going on. "How does this affect me now?" or "How will this affect me later on?" But the students who don't, they are just constantly asking for the answers. They don't want to think for themselves, don't see the broader spectrum of the world. That's something that is very important. I feel that we are kind of losing that with our students. That the creativity is starting to go, so that broader spectrum that they see, the broader view is starting to go as well. They are very narrow-minded in the sense of what's going on around them. Creative people can look at so many things and just see "Wow! That's really cool." And "How does that affect me around here and how does that affect this?" It just gets them thinking.

8. What is the relationship between your past experiences and creativity? When I was in school, we didn't have the standardized testing, and that was something that I always liked because we got to do a lot more projects. Personally, that's how I learn, through the projects, and being able to take that information and put it in that form as opposed to just a test. I am not a good test taker. I did a lot better with being able to say, "How am I going to make this project pretty cool?" because I didn't want it to be just a normal project. I grew up in a family that had a basis in education, and was constantly pushed. "Well, what are you think it is and what do you think we would do with it?" "How do you think it works?" So it allowed me to come up with ideas for myself. "I think we use for this way and this is how I think this works." and then we'd talk about it and "Yeah, that's right, that is how it works." Or "No, that is a good idea, though, and maybe we could use it in that form." I remember growing up, my dad giving a word of the day and by the end of the day you'd have to figure out what's it mean. You could ask as many questions as you wanted and eventually you'd come

up with an actual definition of that word and it was pretty cool because the words that I remember as an adult, it allowed me to view things a little differently and not look at one thing and think about it in this one way. You know, "How can I look at this and see it in many different ways?" which I really appreciate my parents for.

9. What factors facilitate your ability to foster creativity? In your classroom? In your school? Having a very supportive administration. I went to our principal and said, "I want to put a geologic timeline on the ceiling." She said, "Go for it." That was something that was different. I said to my students, "We are putting a geologic time line on the ceiling. What do we do?" and they had to come up with it. They had to design it and decide how does this go? Here are the dates, here are the things that need to go up there, and now how is this going to go? They had to figure out all the conversions, measure the hallway, and figure everything out. I feel that if I didn't have the support of the administration that would have never happened, and that is something that is pretty cool because that is something that we can share with the entire school. Having co-workers that you can bounce things off of is really awesome. "What about this?" and they say, "Yeah, that's really cool, but what if you change it to this?" Just having co-workers and administration that are really supportive of what you want to do. Here at (the high school), at least for the science, since we have science and math school, even for the regular part of the science teaching, we don't get a lot of money, we can go to them and say, "Can I borrow this from you?" and they say, "Yeah, sure, just make sure I get it back by this time." So that's really great, but the money factor is the hard thing that keeps it away that we can't show a lot of the things that we want to, so in that sense we do have to come up with

extremely creative ways of showing different things. We don't have the money that some schools do to be able to pull out some $3000 dollar something. Sometimes it works out really well. I just ordered a bunch of stuff for the art rock unit to look at the hand specimens, the actual rock itself and then look at it in thin section. "What's it look like under a microscope?" The kids have never seen that before. But the big thing here is we have such a supportive staff. Being able to say, "Can I come in to your classroom and do this?" "Can I do this in the hallway or I want to do this, take these kids on a field trip." Most of the time they say, "Yeah, do it." It's one of the things I really like about this school. We have such a supportive staff that is very creative that we can bounce off a lot of ideas.

You mentioned resources—having money and not having money and adjusting to it. Besides borrowing and seeing what you can get through administration, how else do you work with getting what you feel you need to be creative or get across to students? When we got to some of the units, I take what I already have at home, that's mine, and I'll bring it in and show it to them but then take it back home. When we get to the mineral unit, they school does not have a lot of interesting or cool minerals that kids want to see. They are just the run of the mill minerals that they need to learn and that's kind of boring. I bring in stuff that I have personally and I show them. "These are some of the really cool ones and this is what you use it for." We show the ones that change color under ultra-violet light. Showing them minerals that we use just in everyday life. These are the ones that you can use to make colors and different fire works, or give them different effects in fireworks. The students really enjoy that. I bring in pictures from my own trips and that makes it more of a

personal feel to the students because they know me. In our atmosphere unit, there is a picture of me jumping off a big rock and I am just floating there in the air. The kids are like, "Wow! That's you!" and it starts them getting interested in different things. I tell them about my trips because I've been to all of these places where they haven't had a chance to do that. I show what I've brought back from these places to get them interested in different things. I utilize other teachers from other schools. I try to get things from them, like information. I'm now trying to go to the Science Museum and go to the Planetarium to learn constellations because we don't have one, and I can't get my kids here in the middle of the night. If I can't buy something, I make it. For instance, there's an earthquake table over there I made because I can't afford to buy one. I can make one for how ever much it costs to get PVC pipe and the little nuts and bolt things that we need. We make a lot of the things that we need and then we share it in the department. We share a lot. We do have some things, but only so much can go for the year, and you have to be selective with what you want from year to year. The slides that I got this year will be used for the next few following years. So that's what we try to do a lot of times. **Okay. Thank you. I'll stop the recording.**

Appendix L

Table 13

Frequency Distribution of CFT Index, Across Both Observations

Item *N=9*	*6*	*5*	*4*	*3*	*2*	*1*	*N/O*
1. I encourage students to show me what they have learned on their own.	5.5 (.61)	.5 (.06)	.5 (.06)	0 (.00)	0 (.00)	0 (.00)	2.5 (.28)
2. In my class, students have opportunities to share ideas and views.	7.5 (.83)	0 (.00)	0 (.00)	.5 (.06)	0 (.00)	0 (.00)	1 (.11)
3. Learning the basic knowledge/ skills well is emphasized in my class.	4 (.44)	.5 (.06)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	4.5 (.45)
4. When my students have some ideas, I get them to explore further before I take a stand.	1.5 (.17)	.5 (.06)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	7 (.78)
5. In my class, I probe students' ideas to encourage thinking.	6 (.67)	0 (.00)	.5 (.06)	0 (.00)	0 (.00)	0 (.00)	.5 (.06)
6. I expect my students to check their own work instead of waiting for me to correct them.	1 (.11)	.5 (.06)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	7.5 (.83)
7. I follow up on my students' suggestions so that they know I take them seriously.	8.5 (.94)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	.5 (.06)
8. I encourage my students to try out what they have learned from me in different situations.	3 (.33)	1 (.11)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	5 (.55)
9. My students who are frustrated can come to me for emotional support.	.5 (.06)	0 (.00)	0 (.00)	.5 (.06)	0 (.00)	0 (.00)	8 (.89)
10. I teach my students the basics and leave them to find out more for themselves.	1.5 (.17)	1 (.11)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	6.5 (.72)
11. Students in my class have opportunities to do group work regularly.	3.5 (.39)	1.5 (.17)	1 (.11)	0 (.00)	0 (.00)	0 (.00)	3 (.33)
12. I emphasize the importance of mastering the essential knowledge and skills.	3.5 (.39)	1.5 (.17)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	4 (.44)

13. When my students suggest something, I follow it up with questions to make them think further.	5.5 (.61)	0 (.00)	.5 (.06)	0 (.00)	0 (.00)	0 (.00)	3 (.33)
14. I encourage my students to ask questions freely even if they appear irrelevant.	5.5 (.61)	1.5 (.17)	0 (.00)	.5 (.06)	0 (.00)	0 (.00)	1.5 (.17)
15. I provide opportunities for my students to share their strong and weak points with the class.	.5 (.06)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	8.5 (.94)
16. When my students have questions to ask, I listen to them carefully.	9 (1.0)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	0 (.00)
17. When my students put what they've learnt into different uses, I appreciate them.	4.5 (.45)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	4.5 (.45)
18. I help students who experience failure to cope with it so that they regain their confidence.	.5 (.06)	.5 (.06)	0 (.00)	1 (.11)	0 (.00)	0 (.00)	7 (.78)
19. I leave questions for my students to find out for themselves.	.5 (.05)	1 (.11)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	7.5 (.83)
20. Students in my class are encouraged to contribute to the lesson with their ideas and suggestions.	5.5 (.61)	.5 (.06)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	3 (.33)
21. My students know that I expect them to learn the basic knowledge and skills well.	6.5 (.72)	.5 (.06)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	2 (.22)
22. I do not give my view immediately on students' ideas, whether I agree or disagree with them.	2.5 (.28)	.5 (.06)	.5 (.06)	0 (.00)	0 (.00)	0 (.00)	5.5 (.61)
23. I encourage my students to think in different directions even if some of the ideas might not work.	3 (.33)	.5 (.06)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	5.5 (.61)
24. My students know that I expect them to check their own work before I do.	1 (.11)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	8 (.89)
25. My students know that I do not dismiss their suggestions lightly.	7 (.78)	1 (.11)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	1 (.11)
26. My students are	2	0	0	0	0	0	7

encouraged to do different things with what they have learned in class.	(.22)	(.00)	(.00)	(.00)	(.00)	(.00)	(.78)
27. I help my students to draw lessons from their own failures.	0 (.00)	.5 (.06)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	8.5 (.94)
28. I teach students the basics and leave room for individual learning.	2 (.22)	2 (.22)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	5 (.55)
29. I encourage students to ask questions and make suggestions in my class.	7 (.78)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	2 (.22)
30. Moving from one topic to the next quickly is not my main concern in class.	3 (.33)	1 (.11)	1 (.11)	.5 (.06)	0 (.00)	.5 (.06)	3 (.33)
31. I comment on students' ideas only after they have been more thoroughly explored.	2.5 (.28)	.5 (.06)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	6 (.67)
32. I like my students to take time to think in different ways.	2 (.22)	1 (.11)	.5 (.06)	0 (.00)	0 (.00)	0 (.00)	5.5
33. In my class, students have opportunities to judge for themselves whether they are right or wrong.	0 (.00)	.5 (.06)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	8.5 (.94)
34. I listen to my students' suggestions even if they are not practical or useful.	8 (.89)	.5 (.06)	.5 (.06)	0 (.00)	0 (.00)	0 (.00)	0 (.00)
35. I don't mind my students trying out their own ideas and deviating from what I have shown them.	0 (.00)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	9 (1.0)
36. I encourage students who have frustration to take it as part of the learning process.	0 (.00)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	9 (1.0)
37. I leave open-ended questions for my students to find the answers for themselves.	1.5 (.17)	1 (.11)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	6.5 (.72)
38. Students in my class are expected to co-operatively work in groups.	3.5 (.39)	0 (.00)	1 (.11)	0 (.00)	0 (.00)	0 (.00)	4.5 (.50)
39. Covering the syllabus is not more important to me than making sure the students learn the basics well.	2 (.22)	1 (.11)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	6 (.67)
40. I encourage students to do things differently although	2.5 (.28)	0 (.00)	0 (.00)	.5 (.06)	0 (.00)	0 (.00)	6 (.67)

doing this takes up more time.							
41. I allow students to deviate from what they are told to do.	1 (.11)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	8 (.89)
42. I allow my students to show one another their work before submission.	.5 (.06)	0 (.00)	.5 (.06)	0 (.00)	0 (.00)	0 (.00)	8 (.89)
43. I listen patiently when my students ask questions that may sound silly.	5 (.55)	.5 (.06)	.5 (.06)	0 (.00)	0 (.00)	0 (.00)	3 (.33)
44. Students are allowed to go beyond what I teach them within my subject.	3 (.33)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	6 (.67)
45. I encourage students who experienced failure to find other possible solutions.	0 (.00)	0 (.00)	.5 (.06)	0 (.00)	0 (.00)	0 (.00)	8.5 (.94)

Appendix M

Additional Tables of Observation Data: First and Second Observations

Frequency Distribution of CFT Index Survey Responses, First Observation

Item	*N=9*	*6*	*5*	*4*	*3*	*2*	*1*	*N/O*
1. I encourage students to show me what they have learned on their own.		7 (.78)	1 (.11)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	1 (.11)
2. In my class, students have opportunities to share ideas and views.		8 (.89)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	1 (.11)
3. Learning the basic knowledge/ skills well is emphasized in my class.		2 (.22)	1 (.11)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	6 (.67)
4. When my students have some ideas, I get them to explore further before I take a stand.		1 (.11)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	8 (.89)
5. In my class, I probe students' ideas to encourage thinking.		6 (.67)	0 (.00)	1 (.11)	0 (.00)	0 (.00)	0 (.00)	2 (.22)
6. I expect my students to check their own work instead of waiting for me to correct them.		0 (.00)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	9 (1.0)
7. I follow up on my students' suggestions so that they know I take them seriously.		8 (.89)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	1 (.11)
8. I encourage my students to try out what they have learned from me in different situations.		4 (.44)	1 (.11)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	4 (.44)
9. My students who are frustrated can come to me for emotional support.		1 (.11)	0 (.00)	0 (.00)	1 (.11)	0 (.00)	0 (.00)	7 (.78)
10. I teach my students the basics and leave them to find out more for themselves.		1 (.11)	2 (.22)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	6 (.67)
11. Students in my class have opportunities to do group work regularly.		4 (.44)	1 (.11)	1 (.11)	0 (.00)	0 (.00)	0 (.00)	3 (.33)
12. I emphasize the importance of mastering the essential knowledge and skills.		2 (.22)	2 (.22)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	5 (.56)

13. When my students suggest something, I follow it up with questions to make them think further.	5 (.56)	0 (.00)	1 (.11)	0 (.00)	0 (.00)	0 (.00)	3 (.33)
14. I encourage my students to ask questions freely even if they appear irrelevant.	5 (.56)	3 (.33)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	1 (.11)
15. I provide opportunities for my students to share their strong and weak points with the class.	1 (.11)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	8 (.89)
16. When my students have questions to ask, I listen to them carefully.	9 (1.0)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	0 (.00)
17. When my students put what they've learnt into different uses, I appreciate them.	6 (.67)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	3 (.33)
18. I help students who experience failure to cope with it so that they regain their confidence.	1 (.11)	1 (.11)	0 (.00)	1 (.11)	0 (.00)	0 (.00)	6 (.67)
19. I leave questions for my students to find out for themselves.	1 (.11)	2 (.22)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	6 (.67)
20. Students in my class are encouraged to contribute to the lesson with their ideas and suggestions.	4 (.44)	1 (.11)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	4 (.44)
21. My students know that I expect them to learn the basic knowledge and skills well.	6 (.67)	1 (.11)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	2 (.22)
22. I do not give my view immediately on students' ideas, whether I agree or disagree with them.	3 (.33)	1 (.11)	1 (.11)	0 (.00)	0 (.00)	0 (.00)	4 (.44)
23. I encourage my students to think in different directions even if some of the ideas might not work.	2 (.22)	1 (.11)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	6 (.67)
24. My students know that I expect them to check their own work before I do.	0 (.00)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	9 (1.0)
25. My students know that I do not dismiss their suggestions lightly.	6 (.67)	1 (.11)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	2 (.22)
26. My students are	3	0	0	0	0	0	6

encouraged to do different things with what they have learned in class.	(.33)	(.00)	(.00)	(.00)	(.00)	(.00)	(.67)
27. I help my students to draw lessons from their own failures.	0 (.00)	1 (.11)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	8 (.89)
28. I teach students the basics and leave room for individual learning.	1 (.11)	3 (.33)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	5 (.56)
29. I encourage students to ask questions and make suggestions in my class.	7 (.78)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	2 (.22)
30. Moving from one topic to the next quickly is not my main concern in class.	3 (.33)	1 (.11)	1 (.11)	0 (.00)	0 (.00)	0 (.00)	4 (.44)
31. I comment on students' ideas only after they have been more thoroughly explored.	2 (.22)	1 (.11)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	6 (.67)
32. I like my students to take time to think in different ways.	3 (.33)	1 (.11)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	5 (.56)
33. In my class, students have opportunities to judge for themselves whether they are right or wrong.	0 (.00)	1 (.11)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	8 (.89)
34. I listen to my students' suggestions even if they are not practical or useful.	8 (.89)	1 (.11)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	0 (.00)
35. I don't mind my students trying out their own ideas and deviating from what I have shown them.	0 (.00)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	9 (1.0)
36. I encourage students who have frustration to take it as part of the learning process.	0 (.00)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	9 (1.0)
37. I leave open-ended questions for my students to find the answers for themselves.	2 (.22)	1 (.11)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	6 (.67)
38. Students in my class are expected to co-operatively work in groups.	4 (.44)	0 (.00)	1 (.11)	0 (.00)	0 (.00)	0 (.00)	4 (.44)
39. Covering the syllabus is not more important to me than making sure the students learn the basics well.	2 (.22)	1 (.11)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	6 (.67)
40. I encourage students to do things differently although	3 (.33)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	6 (.67)

doing this takes up more time.							
41. I allow students to deviate from what they are told to do.	0 (.00)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	9 (1.0)
42. I allow my students to show one another their work before submission.	0 (.00)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	9 (1.0)
43. I listen patiently when my students ask questions that may sound silly.	5 (.56)	1 (.11)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	3 (.33)
44. Students are allowed to go beyond what I teach them within my subject.	4 (.44)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	5 (.56)
45. I encourage students who experienced failure to find other possible solutions.	0 (.00)	0 (.00)	1 (.11)	0 (.00)	0 (.00)	0 (.00)	8 (.89)

Descriptive Statistics for CFT Index Results, First Observation

Scale *N=9*	*Mean*	*SD*	*Minimum*	*Maximum*
Question	5.13	1.00	3.60	6.00
Integration	4.00	1.49	1.20	5.80
Flexibility	2.78	1.48	0.00	4.80
Motivation	2.76	2.26	0.00	5.80
Independence	2.60	1.54	1.20	5.20
Opportunities	2.38	1.87	0.00	4.60
Judgment	2.27	2.06	0.00	6.00
Frustration	0.71	0.55	0.00	1.20
Evaluation	0.24	0.49	0.00	1.20
Composite Measure	2.54	1.41	.67	4.51

Frequency Distribution of CFT Index Survey Responses, First Observation

Item *N=9*	*6*	*5*	*4*	*3*	*2*	*1*	*N/O*
Independence	12 (.27)	9 (.20)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	24 (.53)
Integration	27 (.60)	2 (.04)	2 (.04)	0 (.00)	0 (.00)	0 (.00)	14 (.31)
Motivation	15 (.33)	6 (.13)	1 (.02)	0 (.00)	0 (.00)	0 (.00)	23 (.51)
Judgment	14 (.31)	2 (.04)	2 (.04)	0 (.00)	0 (.00)	0 (.00)	27 (.60)

Flexibility	16 (.36)	5 (.11)	1 (.00)	0 (.00)	0 (.00)	0 (.00)	23 (.51)
Evaluation	1 (.02)	1 (.02)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	43 (.96)
Question	36 (.80)	3 (.07)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	6 (.13)
Opportunities	17 (.38)	1 (.02)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	27 (.60)
Frustration	2 (.04)	2 (.04)	1 (.02)	2 (.04)	0 (.00)	0 (.00)	38 (.84)
Composite Measure	140 (.35)	31 (.08)	7 (.02)	2 (.00)	0 (.00)	0 (.00)	225 (.56)

Descriptive Statistics for CFT Index Results, Second Observation

Item	*N=9*	*Mean*	*SD*	*Minimum*	*Maximum*
7. I follow up on my students' suggestions so that they know I take them seriously.		6.00	0.00	6.00	6.00
16. When my students have questions to ask, I listen to them carefully.		6.00	0.00	6.00	6.00
25. My students know that I do not dismiss their suggestions lightly.		5.88	0.33	5.00	6.00
34. I listen to my students' suggestions even if they are not practical or useful.		5.77	0.66	4.00	6.00
2. In my class, students have opportunities to share ideas and views.		5.00	2.12	0.00	6.00
20. Students in my class are encouraged to contribute to the lesson with their ideas and suggestions.		4.66	2.65	0.00	6.00
21. My students know that I expect them to learn the basic knowledge and skills well.		4.66	2.65	0.00	6.00
29. I encourage students to ask questions and make suggestions in my class.		4.66	2.65	0.00	6.00
14. I encourage my students to ask questions freely even if they appear irrelevant.		4.33	2.65	0.00	6.00
3. Learning the basic knowledge/skills well is emphasized in my class.		4.00	3.00	0.00	6.00
5. In my class, I probe students' ideas to encourage thinking.		4.00	3.00	0.00	6.00
13. When my students suggest something, I follow it up with questions to make them think further.		4.00	3.00	0.00	6.00

12. I emphasize the importance of mastering the essential knowledge and skills.	3.88	2.93	0.00	6.00
43. I listen patiently when my students ask questions that may sound silly.	3.77	2.91	0.00	6.00
11. Students in my class have opportunities to do group work regularly.	3.55	2.74	0.00	6.00
30. Moving from one topic to the next quickly is not my main concern in class.	3.44	2.55	0.00	6.00
1. I encourage students to show me what they have learned on their own.	3.11	3.02	0.00	6.00
23. I encourage my students to think in different directions even if some of the ideas might not work.	2.66	3.16	0.00	6.00
28. I teach students the basics and leave room for individual learning.	2.55	3.05	0.00	6.00
38. Students in my class are expected to co-operatively work in groups.	2.44	2.96	0.00	6.00
17. When my students put what they've learnt into different uses, I appreciate them.	2.00	3.00	0.00	6.00
31. I comment on students' ideas only after they have been more thoroughly explored.	2.00	3.00	0.00	6.00
4. When my students have some ideas, I get them to explore further before I take a stand.	1.88	2.85	0.00	6.00
6. I expect my students to check their own work instead of waiting for me to correct them.	1.88	2.85	0.00	6.00
8. I encourage my students to try out what they have learned from me in different situations.	1.88	2.85	0.00	6.00
39. Covering the syllabus is not more important to me than making sure the students learn the basics well.	1.88	2.85	0.00	6.00
32. I like my students to take time to think in different ways.	1.66	2.55	0.00	6.00
40. I encourage students to do things differently although doing this takes up more time.	1.66	2.65	0.00	6.00
10. I teach my students the basics and leave them to find out more for themselves.	1.33	2.65	0.00	6.00
22. I do not give my view immediately on students' ideas, whether I agree or disagree with them.	1.33	2.65	0.00	6.00

24. My students know that I expect them to check their own work before I do.	1.33	2.64	0.00	6.00
41. I allow students to deviate from what they are told to do.	1.33	2.65	0.00	6.00
44. Students are allowed to go beyond what I teach them within my subject.	1.33	2.65	0.00	6.00
37. I leave open-ended questions for my students to find the answers for themselves.	1.22	2.44	0.00	6.00
42. I allow my students to show one another their work before submission.	1.11	2.26	0.00	6.00
26. My students are encouraged to do different things with what they have learned in class.	0.66	2.00	0.00	6.00
18. I help students who experience failure to cope with it so that they regain their confidence.	0.33	1.00	0.00	3.00
9. My students who are frustrated can come to me for emotional support.	0.00	0.00	0.00	0.00
15. I provide opportunities for my students to share their strong and weak points with the class.	0.00	0.00	0.00	0.00
19. I leave questions for my students to find out for themselves.	0.00	0.00	0.00	0.00
27. I help my students to draw lessons from their own failures.	0.00	0.00	0.00	0.00
33. In my class, students have opportunities to judge for themselves whether they are right or wrong.	0.00	0.00	0.00	0.00
35. I don't mind my students trying out their own ideas and deviating from what I have shown them.	0.00	0.00	0.00	0.00
36. I encourage students who have frustration to take it as part of the learning process.	0.00	0.00	0.00	0.00
45. I encourage students who experienced failure to find other possible solutions.	0.00	0.00	0.00	0.00

Frequency Distribution of CFT Index Survey Responses, Second Observation

Item	*N=9*	*6*	*5*	*4*	*3*	*2*	*1*	*N/O*
1. I encourage students to show me what they have learned on		4 (.44)	0 (.00)	1 (.11)	0 (.00)	0 (.00)	0 (.00)	4 (.44)

their own.							
2. In my class, students have opportunities to share ideas and views.	7 (.78)	0 (.00)	0 (.00)	1 (.11)	0 (.00)	0 (.00)	1 (.11)
3. Learning the basic knowledge/ skills well is emphasized in my class.	6 (.67)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	3 (.33)
4. When my students have some ideas, I get them to explore further before I take a stand.	2 (.22)	1 (.11)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	6 (.67)
5. In my class, I probe students' ideas to encourage thinking.	6 (.67)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	3 (.33)
6. I expect my students to check their own work instead of waiting for me to correct them.	2 (.22)	1 (.11)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	6 (.67)
7. I follow up on my students' suggestions so that they know I take them seriously.	9 (1.0)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	0 (.00)
8. I encourage my students to try out what they have learned from me in different situations.	2 (.22)	1 (.11)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	6 (.67)
9. My students who are frustrated can come to me for emotional support.	0 (.00)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	9 (1.0)
10. I teach my students the basics and leave them to find out more for themselves.	2 (.22)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	7 (.78)
11. Students in my class have opportunities to do group work regularly.	3 (.33)	2 (.22)	1 (.11)	0 (.00)	0 (.00)	0 (.00)	3 (.33)
12. I emphasize the importance of mastering the essential knowledge and skills.	5 (.56)	1 (.11)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	3 (.33)
13. When my students suggest something, I follow it up with questions to make them think further.	6 (.67)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	3 (.33)
14. I encourage my students to ask questions freely even if they appear irrelevant.	6 (.67)	0 (.00)	0 (.00)	1 (.11)	0 (.00)	0 (.00)	2 (.22)
15. I provide opportunities for my students to share their strong and weak points with the class.	0 (.00)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	9 (1.0)

16. When my students have questions to ask, I listen to them carefully.	9 (1.0)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	0 (.00)
17. When my students put what they've learnt into different uses, I appreciate them.	3 (.33)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	6 (.67)
18. I help students who experience failure to cope with it so that they regain their confidence.	0 (.00)	0 (.00)	0 (.00)	1 (.11)	0 (.00)	0 (.00)	8 (.89)
19. I leave questions for my students to find out for themselves.	0 (.00)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	9 (1.0)
20. Students in my class are encouraged to contribute to the lesson with their ideas and suggestions.	7 (.78)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	2 (.22)
21. My students know that I expect them to learn the basic knowledge and skills well.	7 (.78)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	2 (.22)
22. I do not give my view immediately on students' ideas, whether I agree or disagree with them.	2 (.22)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	7 (.78)
23. I encourage my students to think in different directions even if some of the ideas might not work.	4 (.44)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	5 (.56)
24. My students know that I expect them to check their own work before I do.	2 (.22)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	7 (.78)
25. My students know that I do not dismiss their suggestions lightly.	8 (.89)	1 (.11)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	0 (.00)
26. My students are encouraged to do different things with what they have learned in class.	1 (.11)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	8 (.89)
27. I help my students to draw lessons from their own failures.	0 (.00)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	9 (1.0)
28. I teach students the basics and leave room for individual learning.	3 (.33)	1 (.11)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	5 (.56)
29. I encourage students to ask questions and make suggestions in my class.	7 (.78)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	2 (.22)
30. Moving from one topic to	3	1	1	1	0	1	2

the next quickly is not my main concern in class.	(.33)	(.11)	(.11)	(.11)	(.00)	(.11)	(.22)
31. I comment on students' ideas only after they have been more thoroughly explored.	3 (.33)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	6 (.67)
32. I like my students to take time to think in different ways.	1 (.11)	1 (.11)	1 (.11)	0 (.00)	0 (.00)	0 (.00)	6 (.67)
33. In my class, students have opportunities to judge for themselves whether they are right or wrong.	0 (.00)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	9 (1.0)
34. I listen to my students' suggestions even if they are not practical or useful.	8 (.89)	0 (.00)	1 (.11)	0 (.00)	0 (.00)	0 (.00)	0 (.00)
35. I don't mind my students trying out their own ideas and deviating from what I have shown them.	0 (.00)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	9 (1.0)
36. I encourage students who have frustration to take it as part of the learning process.	0 (.00)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	9 (1.0)
37. I leave open-ended questions for my students to find the answers for themselves.	1 (.11)	1 (.11)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	7 (.78)
38. Students in my class are expected to co-operatively work in groups.	3 (.33)	0 (.00)	1 (.11)	0 (.00)	0 (.00)	0 (.00)	5 (.56)
39. Covering the syllabus is not more important to me than making sure the students learn the basics well.	2 (.22)	1 (.11)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	6 (.67)
40. I encourage students to do things differently although doing this takes up more time.	2 (.22)	0 (.00)	0 (.00)	1 (.11)	0 (.00)	0 (.00)	6 (.67)
41. I allow students to deviate from what they are told to do.	2 (.22)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	7 (.78)
42. I allow my students to show one another their work before submission.	1 (.11)	0 (.00)	1 (.11)	0 (.00)	0 (.00)	0 (.00)	7 (.78)
43. I listen patiently when my students ask questions that may sound silly.	5 (.56)	0 (.00)	1 (.11)	0 (.00)	0 (.00)	0 (.00)	3 (.33)
44. Students are allowed to go beyond what I teach them within my subject.	2 (.22)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	7 (.78)

45. I encourage students who experienced failure to find other possible solutions.	0 (.00)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	9 (1.0)

Descriptive Statistics for CFT Index Results, Second Observation

Scale *N=9*	*Mean*	*SD*	*Minimum*	*Maximum*
Question	5.49	0.61	4.80	6.00
Integration	4.07	1.28	2.00	6.00
Motivation	3.58	1.72	1.20	6.00
Flexibility	2.80	1.96	0.00	6.00
Judgment	2.18	2.11	0.00	6.00
Independence	1.64	1.17	0.00	3.20
Opportunities	1.18	1.88	0.00	4.80
Evaluation	0.87	1.09	0.00	2.40
Frustration	0.07	0.20	0.00	0.60
Composite Measure	2.43	1.34	.89	4.56

Frequency Distribution of CFT Index Survey Responses, Second Observation

Item *N=9*	*6*	*5*	*4*	*3*	*2*	*1*	*N/O*
Independence	10 (.22)	2 (.04)	1 (.02)	0 (.00)	0 (.00)	0 (.00)	32 (.71)
Integration	27 (.60)	2 (.04)	2 (.04)	1 (.02)	0 (.00)	0 (.00)	13 (.29)
Motivation	23 (.51)	3 (.07)	1 (.02)	1 (.02)	0 (.00)	1 (.02)	16 (.36)
Judgment	15 (.33)	1 (.02)	0 (.00)	1 (.02)	0 (.00)	0 (.00)	28 (.62)
Flexibility	19 (.42)	1 (.02)	1 (.02)	1 (.02)	0 (.00)	0 (.00)	23 (.51)
Evaluation	5 (.11)	1 (.02)	1 (.02)	0 (.00)	0 (.00)	0 (.00)	38 (.84)
Question	39 (.87	1 (.02)	2 (.04)	0 (.00)	0 (.00)	0 (.00)	3 (.07)
Opportunities	8 (.18)	1 (.02)	0 (.00)	0 (.00)	0 (.00)	0 (.00)	36 (.80)
Frustration	0 (.00)	0 (.00)	0 (.00)	1 (.02)	0 (.00)	0 (.00)	44 (.98)
Composite Measure	146 (.36)	12 (.03)	8 (.02)	5 (.01)	0 (.00)	1 (.00)	233 (.58)

Appendix N

Investigator's Reflective Journal

August 11, 2007

Giftedness is a theme of educational study that has brought many students to the EPPL program with an emphasis in Gifted Education Administration. I discovered creativity in many of the classes I took. I became intrigued by creativity, and have since decided to study the behaviors of secondary teachers who report using creativity-fostering behaviors in their classroom. Arguably, I am assuming that the majority of the teachers in a school have some type of behaviors with which they teach their students, thereby making them appropriate for this study. This course of study was suggested by a Dr. VanTassel-Baska, but the more I reflect on it and the possible questions and outcomes, the more I see that this is a study that fits me and my experiences as a teacher during the age of high-stakes standardized tests.

As I've reflected, I've found that the concept of creativity 'caught my interest' for many reasons. I was also surprised at those reasons.

While in first grade, I achieved above-level in mathematics and reading. The teachers that I had at my tiny parochial school did not know what to do with me since I was ready for a compacted curriculum. It was decided that I would be separated from my class mates and given 'accelerated' dittos to complete. After awhile, I lost the intrinsic value that I had in the beginning of school for excelling, and it became easier, and less embarrassing, to just stay with the rest of the class so I could be accepted by the other boys that I spent the rest of the day with, especially during recess. The teachers did not seem to have any reaction but relief to my intellectual

decline and it seemed to be better for everyone. My parents showed the same lukewarm support for either an 'A' or 'C' grade that I brought home. The dumbing-down continued as I stayed under the radar for the next six years. In seventh grade, adolescence helped me to decide that I was going to turn off my brain for the time being, and I was failing math in terrific fashion. I had graduated from a small Catholic school with five other sixth graders ten miles out of town to the inner city junior high of 1,100 students. My hair was blonde and curly and there were too many new girls to meet. I dressed like the youngest child of a Catholic family hand-me-down freak, so my schedule was full and my work cut out for me. I don't remember the details, but Mrs. Timque, a seventh grade math teacher, took me on as a project and although I didn't tell her or let her know, she planted in me the notion that some adult out there knew what I was going through, knew who I *really* was, and took time to do something about it. She called my parents into school, which no one else had ever done, and sat down with us to discuss her perceptions of my math ability and lack of responsibility. It became obvious that she cared for me as a student and for my education. She gave guidelines and rules, made suggestions for success, did not buy my lame excuses, and supported me with well wishes and her positive view of my future. She was not upset, angry at me, or easily deceived. She didn't let little things slip by, nor did she ignore my acting out and terrible math work. Looking back today, I hope that somehow she understood that I appreciated what she was doing for me. At the age of thirteen I don't think that I knew how to appreciate someone, show appreciation, or even realize that someone was genuinely trying to help me. I was a mess.

I made it through high school by taking both the easy classes and the half day of vocational/technical class, and fitting in as many study halls as possible. After high school graduation, my parents were not interested in assisting me or my siblings with our future, so I followed my two older brothers' lead and joined the military. The Air Force opened my eyes to my personal self and the world, and I knew that education was the way out of a mediocre life working with listless people. The G.I. Bill helped pay for a small portion of my undergraduate degree at Dickinson College, and it was there that, over two summers, I worked with local students in the college library. They were becoming teachers, and listening to their enthusiastic talk of working with children awoke something in me that inspired me to pursue another bachelor's degree after I graduated with an English degree in May.

Somehow, and I guess this was a subconscious decision; I ended up as an elementary school teacher. I was 27 years old when I decided to pursue this career, but two years later when I began spending time in the classroom with gifted students, I knew I had somehow come to the right decision. The creative lessons I felt I had to create made me feel like I belonged. I was giving back what someone had given me; caring, understanding, and guidance. I had survived negative experiences related to giftedness, I knew how the accelerated students felt, and I was inspired to do all I could to not let their enthusiasm for learning, their creativeness, and their giftedness fade or become a curse.

I have had a lifetime of experiences with creativity and have studied its impact on students in the classroom. My beliefs encompass the idea that students must be taught by a creative and creativity-fostering teacher. Therefore, I believe all teachers

should be devoted to the students and have an understanding of the limits and deep depths of their creativity.

August 16th, 2007 (Can you tell that it's summer? I actually have time to think, reflect, and write!!)

During this study I hope to discover the perceived sources of teachers' creative inspiration. Certainly some experience in their lives has made them aspire to be creative to creativity-fostering educators. I am interested in the connections made by teachers as to why they are creative, why they want to be creative, and how they go about being creative in their classrooms. I hope that my survey and interview causes the teacher participants to have thoughtful and deep reflection that reaffirms the direction they have taken. Without appearing lofty, I think that life is improved when current directions are carefully planned and proven to be correct.

I expect to find privilege, or a special advantage, in some aspect of the informants' lives. Whether it is financial, support from family, or support from a mentor, I would argue that creativity can only be cultivated by experiences caused by privilege. Lack of experience is a creativity killer.

Lastly, I have a feeling that there is a correlation between privilege, race, and creativity. Perhaps the analysis of the data collected from participants will find that more Caucasian students succeed, and perhaps have more privilege than non Caucasian students. I think that even the sample alone may suggest a correlation.

August 22, 2007

I'm thinking that my study will shed light on the thoughts and ideas of teachers who consider themselves to foster-creativity. I guess I am willing to discover

all of the "Disney-version" themes such as triumph always prevails over evil, or human intentions are basically good, and that the good guy always wins. I guess it goes without saying that I will accept all discoveries that I know and have had experience with in the past, or that seem or feel right. I will have to be careful not to make the square pegs of unacceptable discoveries fit into the circular whole of my beliefs.

However, I am not willing to accept, or do not anticipate finding, discoveries that suggest teachers are not motivated or think they are not motivated by past experiences. I am not willing to find that these teachers are teaching because they have failed in other career venues, or believe that teaching is an easy job used to tide them over, or keep a small, steady income while pursuing other interests. I am not willing to find teachers who are not inspired by the idea of touching the future, or enthusiastic about the endeavor of working with children. I am not willing to discover participants that want to work in education but take education lightly.

August 26, 2007

I've been thinking about my dissertation study. Part of the study's research strategy falls under the qualitative research tradition of phenomenology, where I'll put the lived experience of the teachers under the microscope to seek out their perspectives. My assumption is such that, as an interpretists, knowledge is subjective, and as an investigator, I will connect directly with the participants to understand their view of the orderly world. I will interview the participants to gather narrative data to reach a deeper understanding of the study questions and the participants' world view.

September 4, 2007

I have been thinking about the sample size for my study. Having thirty participants for a qualitative study seems large, but small for positivist paradigms. Patton thinks that the size is okay and maybe even a little large. I am hopeful that the number of participants will help my triangulation and the emergent of themes for my study.

October 18, 2007

My first rounds of observations are complete. I have many questions about using Soh's behavior statements as an observation form. For example, number 28, an Independence behavior, states: "I teach students the basics and leave room for individual learning". What does this mean? What are the basics? SOL guidelines? Why would room be left for 'individual learning'? Isn't this a cop-out? Why would a teacher leave student learning to occur outside of the classroom? Where's the research? Also, behavior number 30 states: "Moving from one topic to the next quickly is not my main concern in class". Is this a good or bad thing? Once my students understand perspective in English class, can't we move on without belaboring the fact? I do understand what Soh meant by this statement. He's suggesting that teachers moving from one topic to another for the sake of 'getting it all in before the test' is not conducive to creativity. I think it should be restated in a clear, concise manner.

October 26th, 2007

I am no longer excited about the interview. I was consumed with 'what if' questions. What if it goes awry? What if it is stiff like a first date with someone you just don't get good 'vibes' from? I am really interested in the stories that the

participants have to tell…I just hope that this comes through and not my lack of interview experience. Like I shared in class, my latest interview experience included a guy from the FBI and he just kept staring at me with a 'Used Car Salesman' smile that he altered only to ask another question. (No offense to used car salesmen.) It was sort of creepy…he even wrote on his piece of paper without taking his eyes off me or relaxing that creepy smile. (shudder) I don't want to be too formal or creepy or informal.

December 7th, 2007

My first interview went well. I was able to nod and hold back my agreements or attempt to carry on a normal conversation where the comments go back and forth and piggy back off of each other. As I stated earlier, I was a little worried. I wanted to get it right, and I think I was able to. However, I kept feeling that there was more for the teachers to say when replying to my questions.

November 3rd, 2007

The observations have been very interesting. I was excited to get started on my dissertation study after the late start. I was very excited to sit in on other teachers' classrooms to see what and how they were teaching. In was looking forward to the outcome of the quantitative study.

January 5, 2008

I look forward to coding the interviews. Coding seems a little subjective, so I want to see if my subjectivity is in line with the thought of researcher in the field.

Appendix O

Participant Feedback from Interview Results

Sent: Mon 2/18/2008 12:40 PM
To: Matthew Edinger
Cc:
Subject: RE: Interview Results
Attachments:

Correction: Question #5 "Within our science" should be "within Earth Science"
Otherwise it looks good.

Good Luck,

[Participant]
Science Department

From: Matthew Edinger
Sent: Sun 2/17/2008 10:44 AM
To:
Subject: Interview Results

Hi :

Thanks for taking the time to allow me to interview you. Please review the results of the interview and tell me if it's okay or if I need to change some things.

Thanks!

Matt

Matt Edinger
Middle School
English Department Chair

From: [Participant]
Sent: Mon 1/21/2008 3:22 PM
To: Matthew Edinger
Cc:
Subject: RE: Interview results
Attachments:

Matt,
It looks good to me.

From: Matthew Edinger
Sent: Mon 1/21/2008 9:39 AM
To:
Subject: RE: Interview Results

Hello :

Thanks for your time for the interview.

I was able to transcribe the interview and apply it to my research. Can you read through it and email me any changes that you may find, or if the transcription seems okay with you?

Thank you,

Matt

Matt Edinger
Middle School
English Department Chair

Vita

Matthew J. Edinger

Birth date: February 8, 1967

Birth place: Butler, Pennsylvania

Education:

2003-2008	The College of William and Mary Williamsburg, Virginia Doctor of Philosophy
2001-2003	Coppin State College Baltimore, Maryland Master of Education
1995-1997	Shippensburg University of Pennsylvania Shippensburg, Pennsylvania Bachelor of Science
1992-1994	Dickinson College Carlisle, Pennsylvania Bachelor of Arts